

PERSONAL COMPUTING

A Hayden Publication

May 1984
\$2.50 USA

The PLEASURES And PERILS of Computing At Home

Word Processors:
Are You Buying
More Than You Need?

Why The Big
Corporate Battle
Over Personal
Computers?

"Smart" Software
"For The Rest Of Us"

Relational Data Bases
That Take On
The "Big" Jobs

Canada & International \$3.50



The notebook your parents used didn't do much. At best, it just lay on a desk, a repository for a lot of more-or-less legible handwriting.

NEC's PC-8200 portable computer is a notebook, too. Except it's got big-computer memory and big-computer power—all in a battery-powered 4 lb. package for under \$800. You get a big 40-character/8-line screen. Plus NEC gives you 14 free software packages to start, including an investment portfolio and word processor.

You can use the PC-8200 to take fast, legible notes in class, perform calculations, solve difficult math and science problems, and for virtually anything else you used to do by hand. With optional graphics, you can even doodle. And with the optional printer, you can get rid of your clunky portable typewriter.

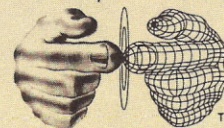
The CMOS-based PC-8200 is the best portable computer you can buy, and at the best price. See it at your NEC dealer before you buy all your school supplies.

NEC CIRCLE 75

**NEC Home Electronics (U.S.A.), Inc.
Personal Computer Division**

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Elk Grove Village, IL 60007

NEC Corporation, Tokyo, Japan



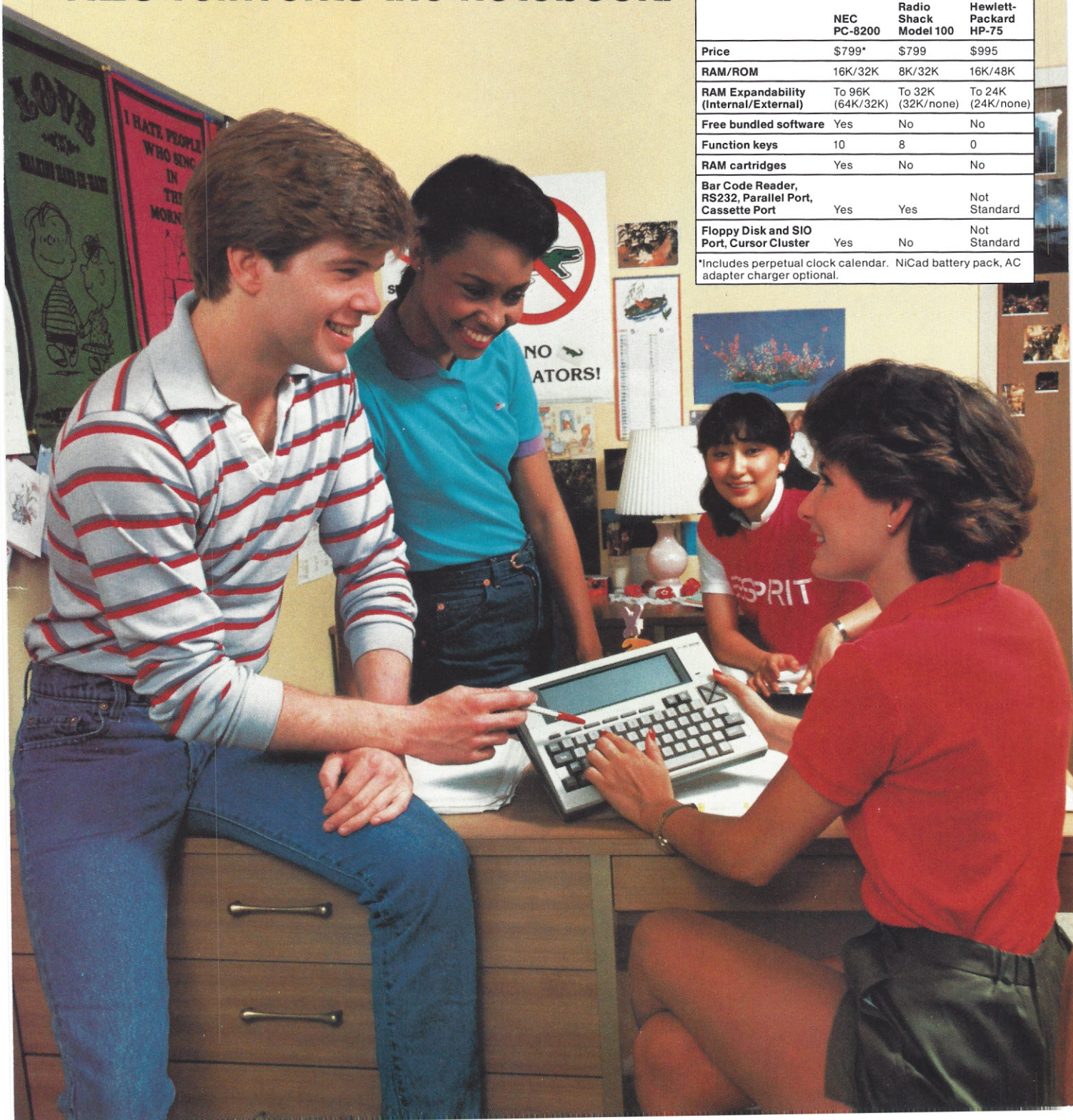
Productivity at your fingertips

NEC reinvents the notebook.

NEC beats the leading competition hands down:

	NEC PC-8200	Radio Shack Model 100	Hewlett- Packard HP-75
Price	\$799*	\$799	\$995
RAM/ROM	16K/32K	8K/32K	16K/48K
RAM Expandability (Internal/External)	To 96K (64K/32K)	To 32K (32K/none)	To 24K (24K/none)
Free bundled software	Yes	No	No
Function keys	10	8	0
RAM cartridges	Yes	No	No
Bar Code Reader, RS232, Parallel Port, Cassette Port	Yes	Yes	Not Standard
Floppy Disk and SIO Port, Cursor Cluster	Yes	No	Not Standard

*Includes perpetual clock calendar. NiCad battery pack, AC adapter charger optional.



One of Japan's leaders would like to go to work for you.



Fujitsu, Japan's largest computer company, sends you their best. The new Micro 16s personal business computer. A combination of thoughtful planning, innovative thinking and quality craftsmanship. Just what you'd expect from a Japanese company that's been making computers for three decades.

The Micro 16s is a complete computer system. The options of other computers are our standards. For example, its price includes the CP/M-86® operating system, SuperCalc™ electronic spreadsheet, WordStar® word processing, a high resolution color graphics monitor, and two microprocessors, the Z80® 8-bit and 8086 16-bit.

The Micro 16s will run any of the more than 3,000 CP/M® software programs on the market today. Optional operating systems for the Micro 16s include MS™-DOS and the

multi-tasking Concurrent CP/M-86™.

The Micro 16s also comes with a detachable keyboard, dual built-in 5¼" floppy disk drives, 128 kilobytes of internal memory expandable to over one megabyte, and expansion slots for future growth.

The unique and flexible design of the Micro 16s makes it easy to add advanced microprocessors of tomorrow, hard disks, mainframe communications or local area networking when the time is right.

Put a Japanese leader to work for you. Fujitsu's Micro 16s. For more information or the name of your nearest dealer call toll free 1-800-MICRO 16. Or write Fujitsu Microelectronics, Inc., Professional Microsystems Division, 3320 Scott Blvd., Santa Clara, CA 95051.

Fujitsu's Micro 16s.™

May 1984

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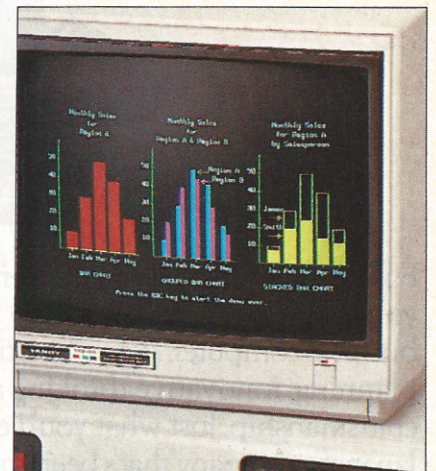
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COVER PHOTOGRAPHY BY FRED VANDERPOEL; ART DIRECTION BY HALL KELLEY; MODELS: DURAN RANDOLPH, JERRY ROBINSON; HAIRSTYLING AND MAKE UP: KARL H. ROLFES; COMPUTER AND SOFTWARE COURTESY OF MISSION COMPUTER CENTERS.

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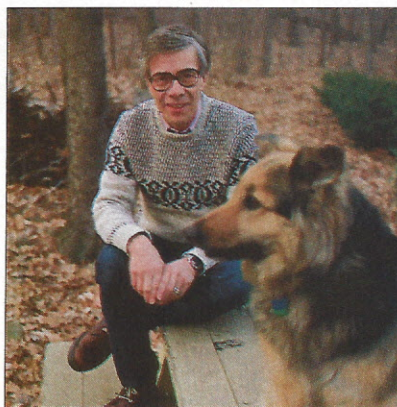
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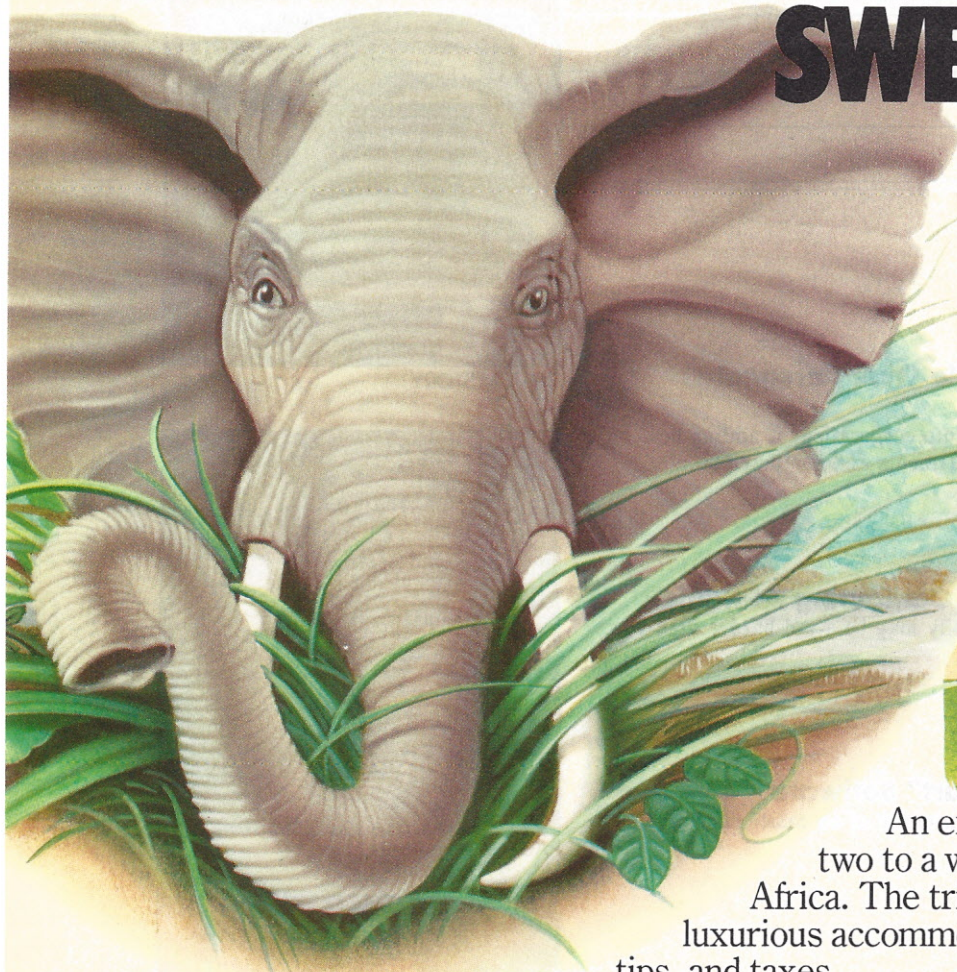


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HOW TO ENTER

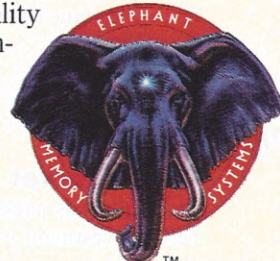
No purchase necessary. Just come into a participating Elephant Safari Sweepstakes dealership where you'll find free entry blanks and official rules. While you're there, check out our full line of quality Elephant memory disks and accompanying products. Entries must be received by July 31, 1984. Void where prohibited.

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THE NEW TOGETHERNESS TECHNOLOGY

In this age of "information overload," few of us have to deal with as much information, or as many people, as The Honorable Senator Howard H. Baker, Jr. Yet the Majority Leader keeps current, keeps in touch and gets the job done, with some help from THE SOURCE.

"I use THE SOURCE just about every night to call up the latest news from Tennessee. Then I make notes of the things I want to attend to the next day," the Senator says.

By using electronic mail on THE SOURCE, the Senator also stays in regular touch with his son, Darek, a computer technician in Memphis.

Dear Darek:

Sorry I missed your phone call. But I did receive your information about the new software, over THE SOURCE. Your instructions were crystal clear (much better than the manufacturer's!). Thanks a megabyte.

Now here's a tip for you. Try that new VR film the next time you shoot photos of the grandchildren. Be sure to take some of you and Karen, too.

Love,
Mom and Dad

Dear Dad:

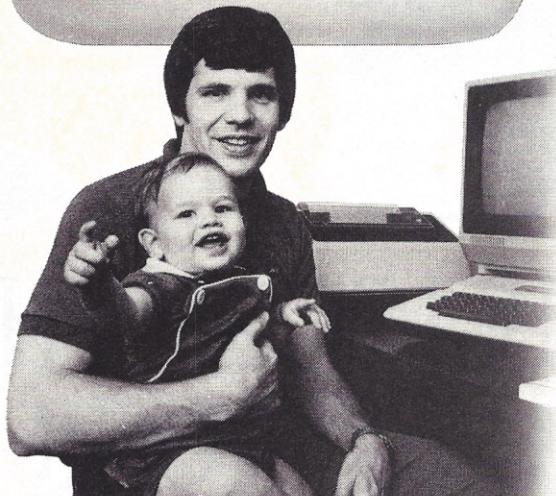
Glad I was able to help with the new software. Your advice about the film came just in time for our photo session. So you see, you're right: What you know and when you know it can be very important...I've taken enough shots of the kids to keep you and mom content for at least a week. Love from us all.

Darek

SOURCEMAILsm is just one of the many features on THE SOURCE, including business and financial information, travel services, news and sports, games and consumer services.

THE SOURCE works for Senator Baker and Darek Baker* as an important tool for keeping informed—and in touch. To see how THE SOURCE can work for you, visit your computer dealer. Or telephone or write us for a subscription application and information package. THE SOURCE is compatible with all major personal computers, terminals and communicating word processors.

*No compensation was provided either Senator Howard Baker or Darek Baker.



Photographer: Terry Ashe

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CIRCLE 38



WITH IBM PC AT THE OFFICE
AND PC_{jr} AT YOUR HOUSE,
YOU CAN TAKE WORK HOME
ON YOUR LITTLE FINGER.

Many business people already know about the IBM® Personal Computer family.

Many are now hearing about its new member, the IBM PCjr.

And some have already discovered how PC and PCjr can work together.



THE JOY OF PERSONAL COMMUTING

PCjr bears a strong resemblance to the rest of the family.

If you know how to operate PC or PC/XT, you can operate PCjr easily. If you have programs for PC or PC/XT, you'll find many of them will run on PCjr.

Now, much of what you start at the office, you can finish at home, and vice versa.

And while you're at the office, your family will find plenty to do with PCjr.

THE BRIGHT LITTLE FAMILY ADDITION THAT CAN GROW UP FAST

PCjr is a powerful tool for modern times. With easy-to-follow new IBM Personal Computer programs, and with options like a printer and an internal modem for telecommunications, it can handle a great variety of jobs.

Children can learn new ways of learning, and make short work of homework. Adults can keep track of household expenses, write letters, file tax data, plug into information networks. And everyone can enjoy challenging new cartridge games.

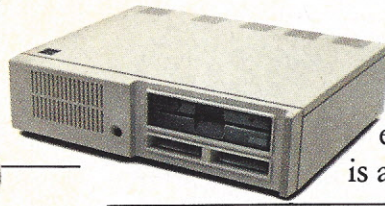
IBM designed PCjr with lots of bright ideas to make computing easier.

The "Freeboard"—a keyboard that doesn't need a connecting cord—is easy to get comfortable with.

Built-in picture instructions can help the first-time user get started.



Diskette-drive systems include a program that allows users to explore computer fundamentals at their own pace. And to get PCjr up and running from the very first day, a sample diskette with eleven useful mini-programs is also included.

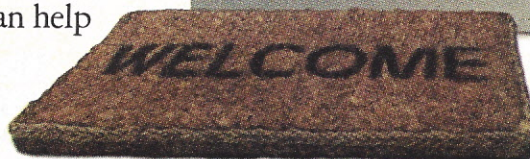
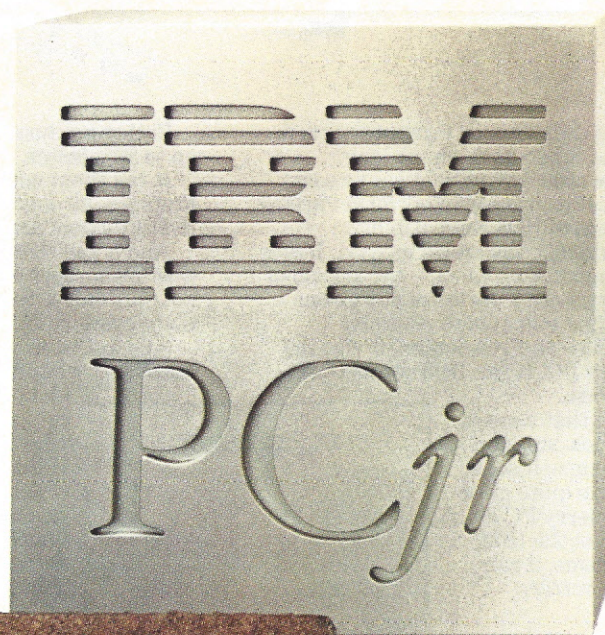


HOME ECONOMICS: IBM DISKETTE COMPUTING FOR ABOUT \$1300

PCjr is the most affordable of the IBM personal computers.

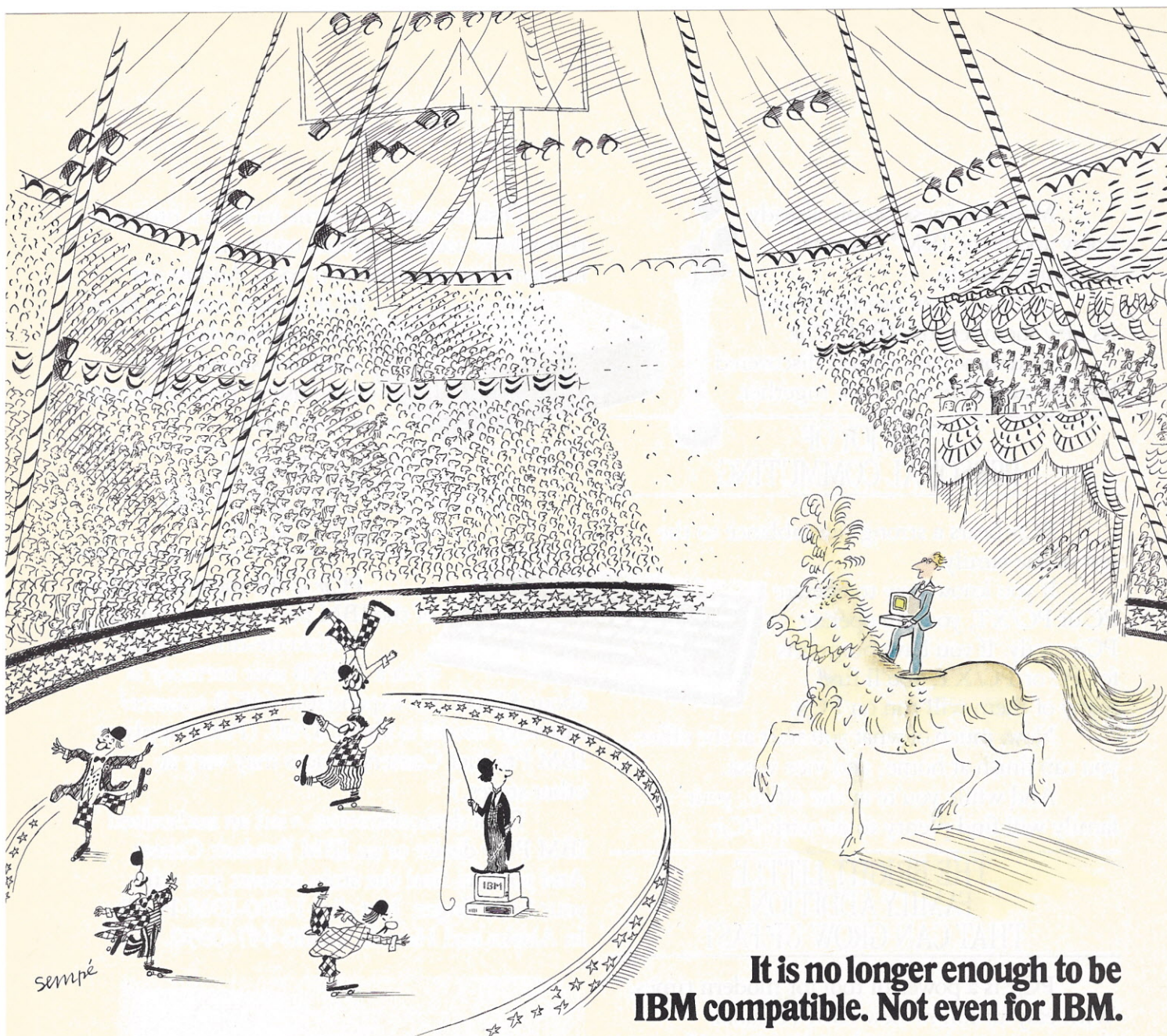
A diskette-drive model with a 128KB user memory is about \$1300. An expandable 64KB cassette/cartridge model is about \$700. (Prices apply at IBM Product Centers. Prices may vary at other stores.)

For a demonstration, visit an authorized IBM PCjr dealer or an IBM Product Center. And you can find the store nearest you with your little finger. Just dial 1-800-IBM-PCJR. In Alaska and Hawaii, 1-800-447-0890.



CIRCLE 170

Little Tramp character licensed by Bubbles Inc., s.a.



It is no longer enough to be IBM compatible. Not even for IBM.

It was the personal computer circus.
And it had gone on too long.

The crowd grew restless as each new act continued to perform varying degrees of IBM compatibility.

Suddenly, the crowd gasped. It was the unexpected finale—the arrival of Sperry, with a performance no one could have imagined possible.

Ladies and gentlemen, it was the Sperry PC. It ran IBM compatible software.

But that wasn't the show stopper.

Because it soon became quite clear the Sperry PC didn't just *run* the IBM programs, it ran them *better*.

SPERRY PERSONAL COMPUTER SPECIFICATIONS	
OPERATING SYSTEM	KEYBOARD
MS DOS Version	84 keys, 6 ft. cord
1.25 or 2.0 with G.W.	AUXILIARY
BASIC MICRO-PROCESSOR	MEMORY
High-Speed 16-bit 8088	Up to two internal 5¼" diskettes 10MB
DISPLAY SCREENS	internal fixed disk when configured with single diskette.
High Definition monochrome display	USER MEMORY
IBM compatible graphics.	Standard 128K bytes, expandable to 640K
COMMUNICATIONS	DIAGNOSTICS
Built-in Asynchronous	Power-on self test
	CLOCK
	Time-of-day with battery back-up

Better because it ran them faster—up to 50% faster.

It ran them with breathtaking graphics, far more dramatic than the IBM PC could provide.

And it ran them from a keyboard that drew roars of approval, for it was not only easier to operate, but far more comfortable than IBM's.

And as the crowd cried out for more, that's just what Sperry gave them: the ability to plug right into a company's main computer, whether that system was IBM or Sperry. Or both.

As the crowd sat stunned by this final flourish, Sperry left all with a most provocative question. Was it possible

that the Sperry PC could do all of this and yet cost less?

Again, the crowd gasped.

Could it be?

Come see for yourself. Hands-on, side-by-side. Call 800-547-8362, toll-free. Or write us. Sperry Corporation, Computer Systems, Department 100, P.O. Box 500, Blue Bell, PA 19424.

SPERRY



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What the personal computer
should have been in the first place.



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\$1990

DIABLO/630
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DAISYWRITER 2000
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Summary of Daisywriter 2000 comparative testing available upon written request.

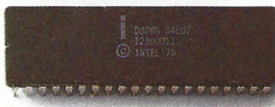
CIRCLE 134

Introducing Macintosh. What makes it tick. And talk.

Well, to begin with, 110 volts of alternating current.

Secondly, some of the hottest hardware to come down the pike in the last 3 years.

The garden variety 16-bit 8088 microprocessor.



Macintosh's 32-bit MC68000 microprocessor.



Some hard facts may be in order at this point:

Macintosh's brain is the same blindingly-fast 32-bit microprocessor we gave our other brainchild, the Lisa™ Personal Computer. Far more powerful than the 16-bit 8088 found in current generation computers.

Its heart is the same Lisa Technology of windows, pull-down menus, mouse commands and icons. All of which make that 32-bit power far more useful by making the Macintosh™ Personal Computer far easier to use than current generation computers. In fact, if you can point without hurting yourself, you can use it.

Now for some small talk.

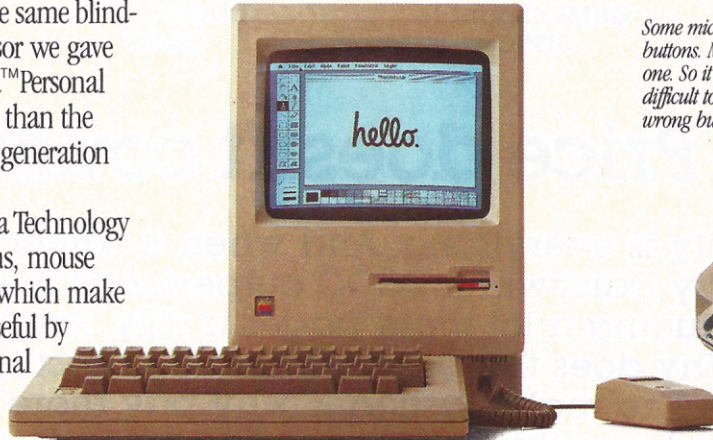
Thanks to its size, if you can't bring the problem to a Macintosh, you can always

bring a Macintosh to the problem. (It weighs 9 pounds less than the most popular "portable.")

Another miracle of miniaturization is Macintosh's built-in 3½" drive. Its disks store 400K—more than conventional 5¼" floppies. So while they're big enough to hold a desk full of work, they're small enough to fit in a shirt pocket. And, they're totally encased in a rigid plastic so they're totally protected.

And talk about programming.

There are already plenty of programs to keep a Macintosh busy. Like MacPaint™



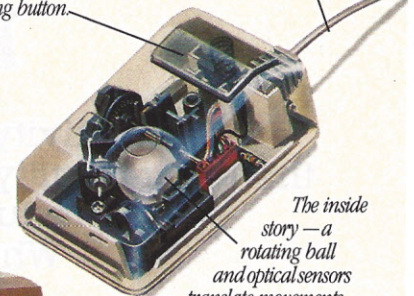
a program that, for the first time, lets a personal computer produce virtually any image the human hand can create. There's more software on the way from developers like Microsoft®, Lotus™, and Software Publishing Corp., to mention a few.

And with Macintosh BASIC, Macintosh Pascal and our Macintosh Toolbox for writing your own mouse-driven programs, you, too, could make big bucks in your spare time.

You can even program Macintosh to talk in other languages, like Yiddish or Serbo-Croatian, because it has a built-in polyphonic sound generator capable of producing high quality speech or music.

The Mouse itself. Replaces typed-in computer commands with a form of communication you already understand — pointing.

Some mice have two buttons. Macintosh has one. So it's extremely difficult to push the wrong button.



The inside story — a rotating ball and optical sensors translate movements of the mouse to Macintosh's screen pointer with pin-point accuracy.

All the right connections.

On the back of the machine, you'll find built-in RS232 and RS422 AppleBus serial communication ports. Which means you can connect printers, modems and other peripherals without adding \$150 cards. It also means that Macintosh is ready to hook in to a local area network. (With AppleBus, you will be able to interconnect up to 16 different Apple computers and peripherals.)

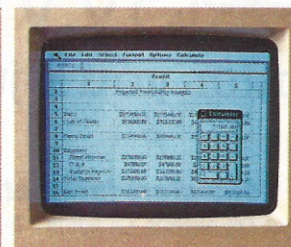
Should you wish to double Macintosh's storage with an external disk



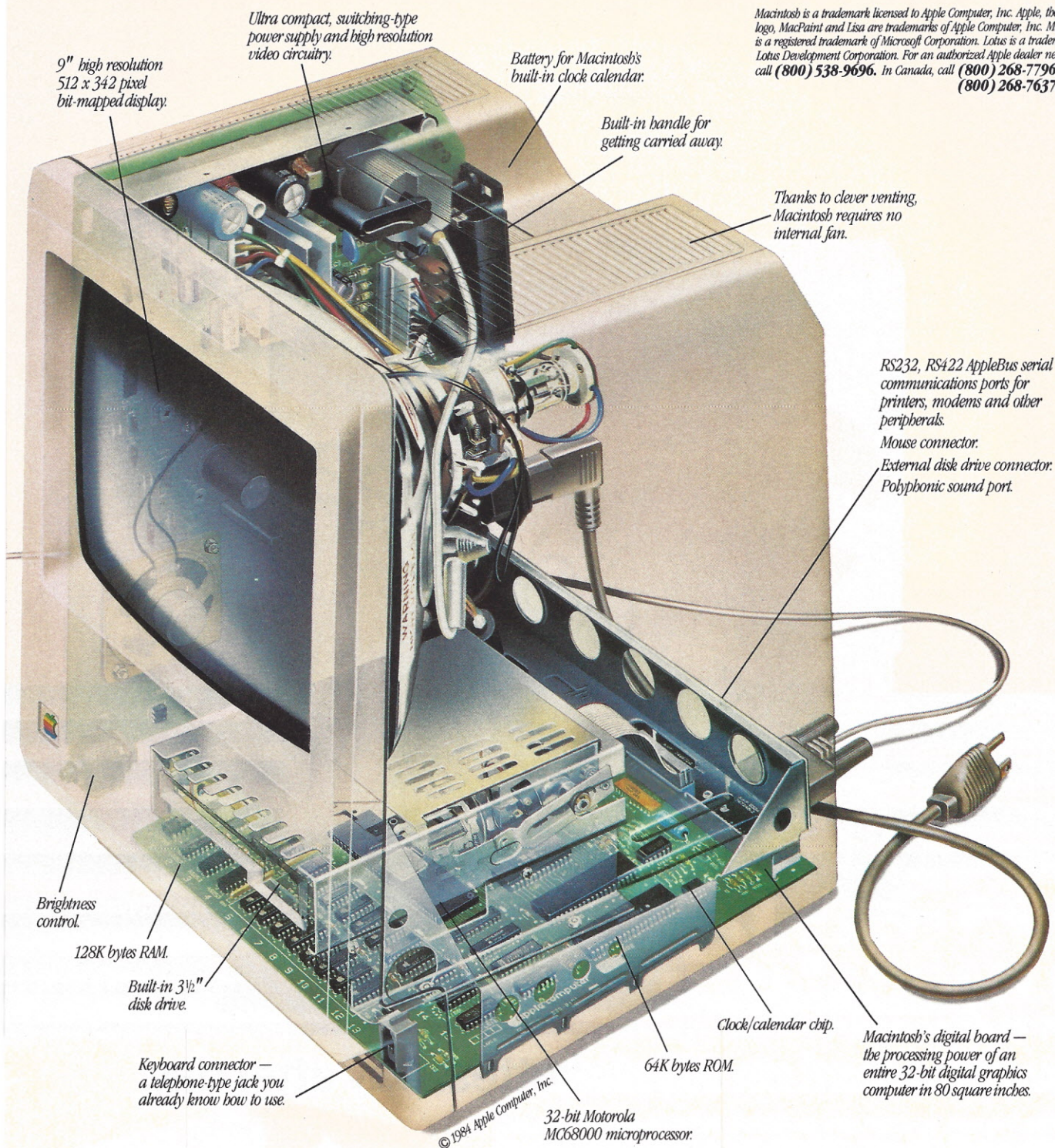
Macintosh automatically makes room for your illustrations in the text.



MacPaint produces virtually any image the human hand can create.



Microsoft's Multiplan for Macintosh.



Macintosh is a trademark licensed to Apple Computer, Inc. Apple, the Apple logo, MacPaint and Lisa are trademarks of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Lotus is a trademark of Lotus Development Corporation. For an authorized Apple dealer near you call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.

drive, you can do so without paying for a disk controller card—that connector's built-in, too.

There's also a built-in connector for Macintosh's mouse, a feature that costs up to \$300 on computers that can't even run mouse-controlled software.

One last pointer.

Now that you've seen some of the logic, the technology, the engineering genius and the software wizardry that separates


Macintosh from conventional computers, we'd like to point you in the direction of your nearest authorized Apple dealer.

Over 1500 of them are eagerly waiting to put a mouse in your hand. As one point-and-click makes perfectly clear, the real genius of Macintosh isn't

its 32-bit Lisa Technology, or its 3 1/2" floppy disks, or its serial ports, or its software, or its polyphonic sound generator.

The real genius is that you don't have to be a genius to use a Macintosh.

You just have to be smart enough to buy one.

Soon there'll be just two kinds of people. Those who use computers. And those who use Apples. 



Reliable.

You can count on 3M diskettes. Day after day.

Just like the sun, you can rely on 3M diskettes every day. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.



3M hears you...

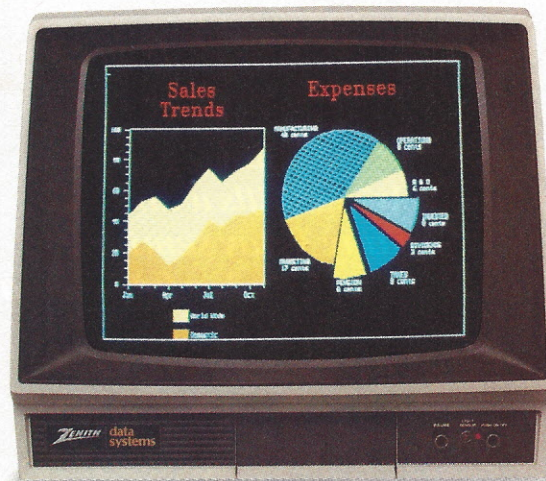
3M

1948



One of the first Zenith television receivers.

1984



ZVM-135: 80 column display. Audio feature ideal for expanded IBM PC Jr.

Only a company with 36 years of TV smarts could make monitors this good.

Zenith introduced its first television receiver to a delighted America in 1948. It had single-knob tuning and an 11-inch porthole screen.

Earlier this year, Zenith made its sixty millionth television set. And every one has been built according to this credo: "The Quality Goes In Before The Name Goes On."

Zenith continues this tradition of video excellence with its extensive line of monitors. Monitors that will first dazzle you with their graphic display, then earn your admiration over time with their reliability. And surprise you with their very competitive prices.

There's a Zenith monitor for just about any personal computer, including IBM and Apple, with seven models offering everything from monochrome green or amber to high-resolution color. And some models can also be used with VCR or video disc systems.

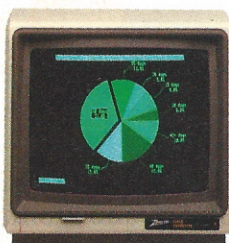
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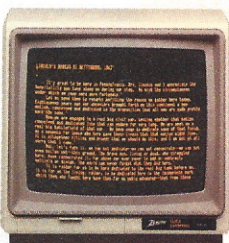
THE QUALITY GOES IN BEFORE THE NAME GOES ON



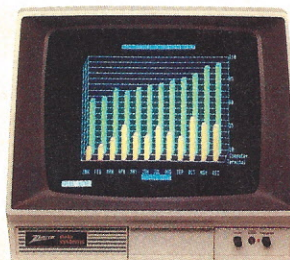
ZVM-122A: Non-glare amber screen. Compatible with most microcomputers.



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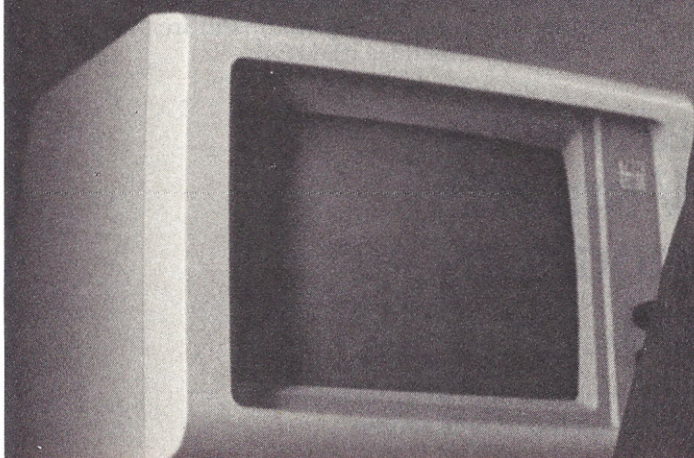


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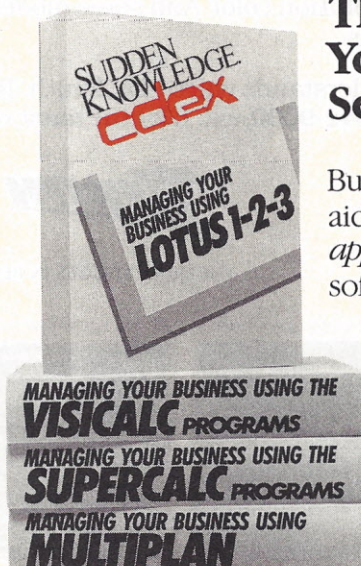
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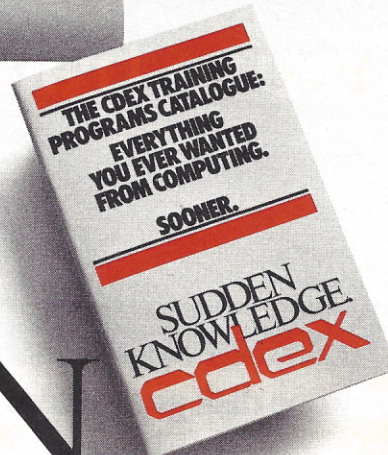
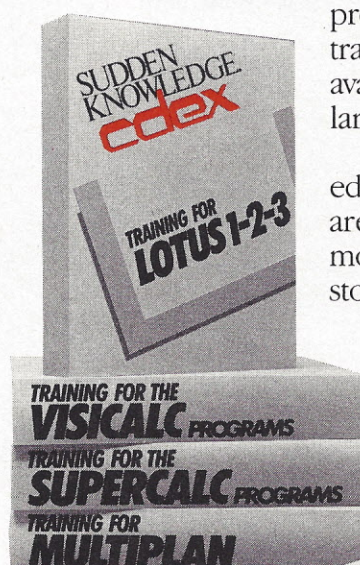
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AN INNOVATIVE WAY OF LOOKING AT COMPATIBILITY

by Christopher O'Malley, Assistant Editor

This is a Radio Shack personal computer?" I said to myself after laying eyes on the sleek new Tandy TRS-80 Model 2000 for the first time.

It was an understandable reaction, really. Radio Shack computers are, after all, known for their somewhat stodgy, all-in-one design. The personal computing world is still in its infancy, yet I had always imagined the TRS-80 line looking more at home in a museum than in the slick, sophisticated world of an automated office. Sure, they're efficient enough, but the look of them . . . ugh.

But here was this state-of-the-art-looking, modular system which is nothing less than downright stylish. Bright, flexible, crisp lines—what a difference!

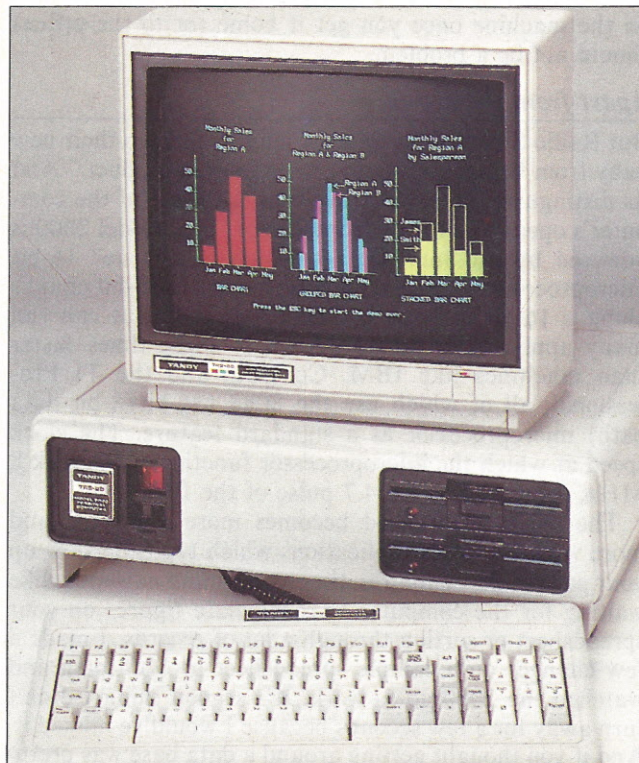
Looks, as it turns out, are not always deceiving. The Model 2000 *is* very different from the rest of the company's line of personal computers—and in a number of ways. While the most obvious of these changes is its appearance, the most significant departure from the status quo in the Model 2000 is the operating system: Microsoft's MS-DOS.

Radio Shack's decision to switch from its proprietary operating system, TRS-DOS, to what is fast becoming the OS of choice, MS-DOS, represents the company's first real move toward integrating its products with the computing world outside the Radio Shack Computer Centers (although the product will still be sold exclusively through the company's almost 1100 outlets). This mainstream approach, induced by the continued success of the IBM Personal Computer and its clones in the workplace, would seem to make a lot of sense. Software compatibility can be a tricky business with personal computers, though, so I was inclined to wonder aloud: "How compatible is the Model 2000?"

The Model 2000, running on MS-DOS 2.0, does not

appear to have any serious problems with software selection. Most of the major IBM-compatible applications packages are available for the Model 2000: spreadsheet programs like Lotus 1-2-3, Multiplan, and SuperCalc; data-management tools like dBASE II, and PFS:FILE; accounting packages like MAI/Basic Four, Peachtree, and The Home Accountant; and word processors like WordStar, PFS:WRITE, and MultiMate.

There are also communications, graphics, programming, and even game packages already available for



Radio Shack's stylish Tandy TRS-80 Model 2000 features a 16-bit microprocessor, MS-DOS 2.0, and 128k RAM.



The Model 2000's emphasis on ergonomics is evident in its keyboard, which can be tilted for easier typing.

the Model 2000. And while many of the packages for the Model 2000 are being distributed through Radio Shack, any program which does not go beyond the conventions of MS-DOS 2.0 to directly address a specific machine's hardware (primarily IBM's) should run on the new TRS-80 system right off the shelf. Many other packages which do go beyond the operating system, such as Lotus 1-2-3, have been or will be converted to run on the Model 2000—a relatively uncomplicated task since it is an MS-DOS machine. In short, finding the right software to run on the machine once you get it home (or to the office) should not be a problem.

Apart from the crowd

But Radio Shack went to great lengths to keep their new baby from being, as they put it, “a me-too product.” And its distinguishing features begin at the heart of the computer's operation: the microprocessor. The Model 2000 is powered by the Intel 80186, which is a “true” 16-bit microprocessor—addressing information in 16-bit chunks along a 16-bit data path. The result is that it can run many applications programs two to three times faster than machines like IBM, Compaq, and the TI Professional, all of which use the 8088 (16-bit/8-bit data path) microprocessor as a standard feature. The clock speed at which the microprocessor functions is a quick 8 MHz, compared to the 4.7 pulse of the IBM.

The increase in speed becomes more noticeable, and more valuable, with applications which typically slow up your pace at the computer: time-consuming nuisances like waiting for the computer to recalculate figures on your spreadsheet or sorting through a lot of records. I made a few changes on a sample spreadsheet in Multiplan and watched the 2000 go to work. It's a good thing I didn't turn away for a few seconds because I would've missed it. And if you thought getting around a data base was pretty easy before, wait until you see the 2000 plow through information.

Another area where speed comes into play is the high-resolution graphics capabilities of the Model 2000. Graphics zip on the screen with a flair of color and detail, and a pixel resolution of up to 640 by 400 (fully twice the color resolution of the IBM). Even the monochrome resolution, which will also support graphics, has an impressive pixel count of 640 by 400. And any eight of 16 colors can be displayed on the screen at one time.

The Model 2000's impressive numbers don't stop with speed and color, though. The internal memory comes standard at 128k RAM and can be upgraded all the way to 768k. The two 5¼" floppy disk drives that are built into the standard configuration of the 2000 have a whopping capacity of 720k each and whirl at a barely audible whisper (the little red “busy” light comes in handy on this machine). These double-sided, double-density drives squeeze a lot of information into a little space, making use of 96 tracks per inch with a fast track-to-track step speed. There is also a hard disk configuration, called the Model 2000 HD, that includes an internal 10Mbyte hard disk drive with a single 720k floppy drive.

A couple of minor points (maybe pet peeves would be a better term) about the Model 2000's disk drives are at least worth a mention. The first, I suppose, is purely a matter of preference, but it irked me a bit nonetheless. The horizontal drives, stacked together at the far right of the CPU, are configured so that drive #2 is at the top and drive #1 at the bottom. In a society that looks at things, for the most part, from left to right and from top to bottom, it just seems a lot more logical to me to have the drives numbered the other way. Yes, it's not that important and I'll get used to it in a hurry, but should I have to?

The other little quirk about the drives that gave me pause to wonder is the somewhat odd way the door on the drives opens and closes. You have to push the disk far enough into the drive until it “takes”; pushing in on the door will then cause the disk to pop out at you part of the way (presumably the benefit gained for all your trouble). The whole thing smacks of much ado about nothing—the simple lift-open doors are fine.

A small nuisance here and there is about all the criticism I could muster after several sessions with the Model 2000. (They could let me keep one, I guess, but that might be asking a bit much.) The impressive numbers that come with the Model 2000 simply let the machine perform that much better—without making it any harder to kick off your shoes and relax with.

Performance figures aside, I just couldn't help having fun with the Model 2000. It is, as I mentioned before, a good-looking machine that somehow seems a lot easier to approach than the Darth Vader-like Models 4, 12, and 16 which typically surround it on a floor display. The clean, crisp, predominantly white look of the CPU, keyboard,

and monitor set-up is an inviting prospect at first glance. Its size won't inspire any hesitation either. The Model 2000 measures in at only about 19 x 21" with the monitor on top of the CPU and the keyboard in front. With options like a monitor pedestal and a CPU floor stand, you could hold the coil-cabled keyboard in your lap and take up 'a measly 8½ x 12" on your desk. The keyboard even slips under the slightly raised CPU for space-saving storage when you're not busily computing away.

The look and size of the Model 2000 are only part of Radio Shack's obvious emphasis on ergonomics—the science of making you and me comfortable (both mentally and physically) with our machines. The cabled keyboard rises only an inch or so off the desk when laid flat, and has retractable legs at the top for tilting the keys toward you to make typing easier.

The keyboard layout, even with a full array of 90 keys, is organized and easy to get used to. The sculpted white keys on the left two-thirds of the keyboard make up the normal typewriter-style layout, while the right third contains the increasingly common numeric keypad, four cursor control keys, and special keys with plain English descriptions like INSERT, DELETE, HOLD, PRINT, and BREAK. There are also 12 function keys, in three groups of four at the top of the keyboard, which can be programmed for special use and labeled accordingly with the slide-out legends above them.

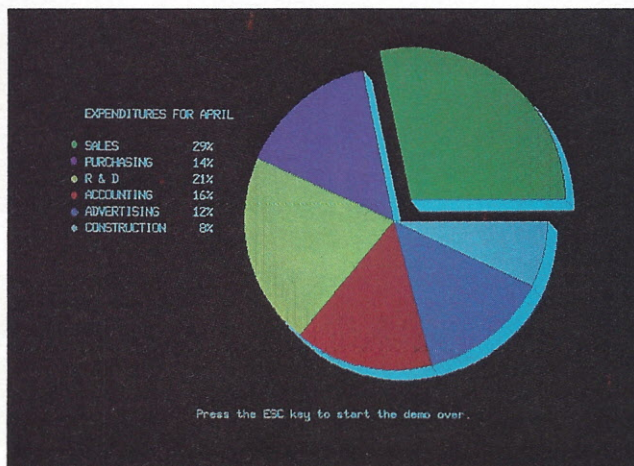
There is no audible feedback, or key-click sound, with the Model 2000 keyboard; You can decide for yourself whether that's a plus or a minus.

The CPU itself is uncluttered both from the front and the rear. The front of the unit houses only the two drives on the right (in standard configuration) and the on/off and reset switches on the left. The clean look of the CPU's back is largely the result of an interesting concept in adding expansion boards: sliding them in. All four card slots can be used for memory, graphics, or special function expansion boards, since the standard configuration leaves them open for your use. And installation is as easy as sliding the plug-in boards into the horizontal slots.

Other external connections on the Model 2000 include a standard parallel printer port, an RS-232-C serial communications port, a monochrome monitor port, and an outlet for the optional mouse.

Radio Shack offers two monitor models (which are not included in the base system) for use with the Model 2000. Both the VM-1 monochrome monitor (\$249) and the CM-1 color monitor (\$799) have high-resolution, 80 by 25 displays, and can tilt slightly to make your viewing a little easier. The VM-1 has a 12" green phosphor screen, while the CM-1 has a 14" screen that will display eight-color graphics with the color graphics options.

While receiving the benefits of the Model 2000's color graphics capabilities involves some extra expense, the




The TRS-80 Model 2000's impressive graphics capabilities include a resolution of up to 640 by 400 pixels.

results—if you have a need and/or desire for quality color graphics—seem well worth it. Exceptional color graphics are an integral part of what separates the Model 2000 from many other MS-DOS machines similar in size and price. The graphics are simply so sharp, so colorful, and so quick that you may decide you want them now and will find a practical use for them later.

The Model 2000, consisting of the CPU and the keyboard, carries a total price tag of \$2750. The hard disk configuration, the Model 2000 HD, retails for \$4250. Both total costs stack up quite favorably against other MS-DOS competitors after they've been equipped with the capabilities of the Model 2000. Features that are standard on the Model 2000—like a second drive, a display adaptor, 128k, RS-232 and parallel printer ports, and the MS-DOS operating system itself—are all somewhat costly options on the IBM Personal Computer and some of its compatibles. And let's not forget the speed, graphics, and disk memory capabilities that simply aren't available on most other personal computers.

All in all, what Radio Shack offers with the Tandy TRS-80 Model 2000 is a great deal more than an attempt to cash in on the popularity of IBM computers and the volumes of software written for them. The company could have, after all, simply produced an MS-DOS machine which so closely emulated the hardware and capabilities of the IBM Personal Computer that compatibility would be near (if not at) 100 percent. Other manufacturers have gone that route with significant success. Radio Shack instead took a more difficult but more innovative trail, and widened the path in several areas with increased capabilities which will undoubtedly be emulated themselves before long.

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A SMALL, QUIET PRINTING REVOLUTION

by Kevin Strehlo, Senior Editor

If you've ever had to leave a room just so you could carry on a polite telephone conversation while your dot-matrix printer hammered out a report, you should take a listen to Thinkjet—Hewlett-Packard's new series of low-cost ink-jet printers designed to be compatible with most personal computers. You'll have to listen carefully, though, because in addition to being inexpensive, the Thinkjets are very quiet. And, as if that weren't enough, they're also small—taking no more space on a desk top than a piece of letter-size paper—yet capable of printing a spreadsheet 142 columns wide, a report at a brisk 150 characters per second, or black-and-white graphs from Lotus 1-2-3.

While the output falls a bit short of letter quality—the individual dots that form characters are visible if you look closely, and the letters seem a tad thin—it does everything the best selling dot-matrix printers do . . . except take up a lot of space and make a lot of noise. Hewlett-Packard hopes these advantages will make the Thinkjet a very popular item on America's desk tops.

Just throw it away

Because there are other ink-jet printers just as quiet as Thinkjet, Hewlett-Packard had to do something to distinguish theirs from the all rest. To achieve this goal, they included numerous features which make the Thinkjet printers the first inexpensive ink-jet printers to solve many of the problems associated with ink-jet printing.

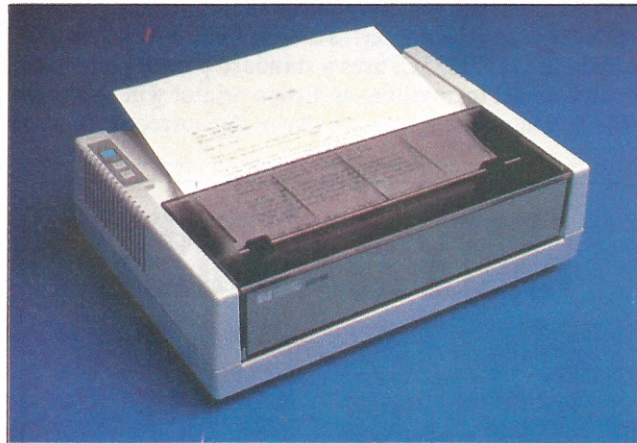
Key to these features is a disposable print head/ink reservoir. The unit—which resembles the thimble-sized containers of coffee creamer with the peel-off tops you find in fast-food establishments—holds enough ink for about 500 pages of printing. The average cost per page is about eight cents. Hewlett-Packard was able to achieve this low cost by applying some of the same technology responsible for cheap microprocessors and memory chips to the mass manufacture of the print head.

Another problem associated with ink-jet printing that Hewlett-Packard found an inexpensive way to solve is that of clogging. Ink-jet printers work by pumping the ink through thin tubes, and are prone to frequent clogging and periodic mechanical failures. Also, because they continually pump the ink—catching what wasn't needed to produce a particular print pattern on the page in a basin and recirculating it—they tended to be a bit messy. Not so with the Thinkjet. The print head issues tiny ink droplets as needed by thermally exciting the ink and making a tiny bubble rise, much as a coffee percolator does. No ink recirculates, no parts move, and clogs are rare. It *can* become partially clogged if the printer is not used for a prolonged period or if dust has accumulated on the print

head—you'll notice that characters seem to be missing some of their dots—but simply wiping the face of the cartridge with a tissue returns print quality to normal.

Think you're out of ink? To find out, you can remove a print head cartridge easily by opening the printer cover and pushing down on a latch. You can tell how much ink is left by looking inside the translucent cartridge shell. If the internal bladder is collapsed and looks empty, you're out of ink. To install a new cartridge, simply slide it into place and lift up the latch until the cartridge is secured.

Changing a cartridge would be no more difficult than changing a ribbon cartridge if it weren't for one thing: Each time you change the print head cartridge, you must also change an "absorber" that comes with it. The absorb-



Hewlett-Packard's new Thinkjet printer offers quiet, high-speed printing in a variety of typefaces.

er works to keep the orifice through which the ink sprays clear. To change the absorber, simply insert the tip of a pencil into the hole at the top of the absorber, pull it out of its holder, and slip in a new one.

The quicker, the better

The Thinkjet series will print on paper other than just computer paper, although the characters in a sample we printed on ordinary notebook paper were slightly blurred, while on ordinary computer paper the characters seemed lighter and thinner. Print quality is optimal on paper that absorbs ink quickly, preventing the ink from being dispersed. Hewlett-Packard sells such paper, which has shorter fibers and no coating, but hopes to stay out of the paper business by putting computer paper distributors in direct contact with the special paper's manufacturer. This should keep the paper cost at about one and a half times the cost of ordinary paper: A case of 2500 sheets of fan-fold with the HP label retails for about \$62.50, and you can expect other sources of the paper to be considerably

PRODUCT REVIEWS

cheaper. You'll be able to buy the paper at the same place you purchase the printer, a spokesman from Hewlett-Packard says, and a toll-free number will be provided to help those users who have trouble locating an outlet.

Three models

Hewlett-Packard always takes care of its own, and so naturally the Thinkjet series of printers has been designed to work with HP's installed base of personal computers. For owners of HP desk-top computers, the Thinkjet model 2225A uses the HP-IB interface (also known as the IEEE-488), and for owners of HP portable calculators and computers, there's the Thinkjet model 2225B, which uses the HP-IL interface.

But HP says it wants to become a printer supplier for the whole market, which requires that a printer run with practically any computer. To that end, a third model, dubbed the HP 2225C, uses a standard parallel interface: It will connect to anything an Epson printer will. A simple table in the owner's manual shows the correct setting of

an easily accessible set of eight DIP switches on the printer's rear panel for Hewlett-Packard, IBM, Apple, or Radio Shack personal computers; an appendix at the back of the manual explains how to set the switches for other personal computers. That compatibility extends beyond hardware to software, because the Thinkjet understands Epson control sequences in text mode and Epson's Graf-trax commands in graphics mode, allowing it to work with almost every software package available. It won't do sub- and superscripting in text mode, however, and in graphics mode it can't do addressing to 1/3 of a dot as the Epson can, but few applications require these capabilities.

The Thinkjets do dot-addressable graphics at two densities: 96 by 96 dots per inch, or 96 vertical by 192 horizontal. In the latter, higher-density mode, printing is not especially speedy: It took several minutes to print a bar graph with just a few square inches of solid fill, but that is comparable to the speed of dot-matrix printers of the same resolution.

In text mode however, the Thinkjet does a fast 150 cps. This is due to the Thinkjet's ability to print bidirectionally, eliminating delays during carriage returns, and to skip quickly past expanses of white space. The Thinkjet does bold and underscored characters in a single pass, whereas conventional dot-matrix printers are slower because they have to make a second pass.

The Thinkjets offer four character pitches—normal (80 characters per line), condensed (142 cpl), expanded (40 cpl), and expanded compressed (71 cpl)—for their single character font, HPRoman8. That font supports Danish, Dutch, English, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish, and Swedish, by the way.

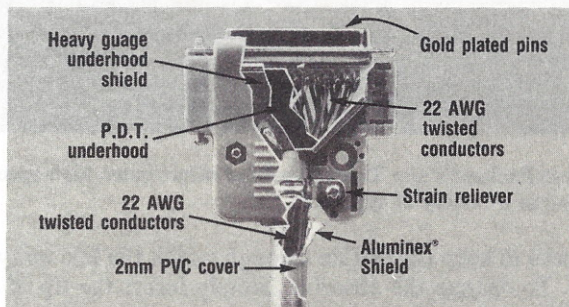
The printer's control panel has a red light to indicate the power is on, a line-feed button that advances the paper a single dot row if tapped quickly or a single line if pressed normally. The form-feed button advances the paper to the top of the next page. You set the position to which the paper advances, called "top of form," by pushing the blue button at the top of the panel, which sets top of form to the line currently under the print head. Rounding out the controls is a yellow attention light, which goes on when you run out of paper and, after paper is loaded, flashes until you position the paper and set the top of the form with the blue button.

The Thinkjet 2225 printers are just the first of a series of printers coming from HP. Although a Hewlett-Packard spokesman could not give us any specific dates, he said future printers based on the disposable cartridge technology will offer higher resolution text, a wider carriage, and, eventually, color.

FOR MORE INFORMATION: HEWLETT-PACKARD CO., 11000 Wolfe Rd., Cupertino, CA 95014 (800) 367-4772.



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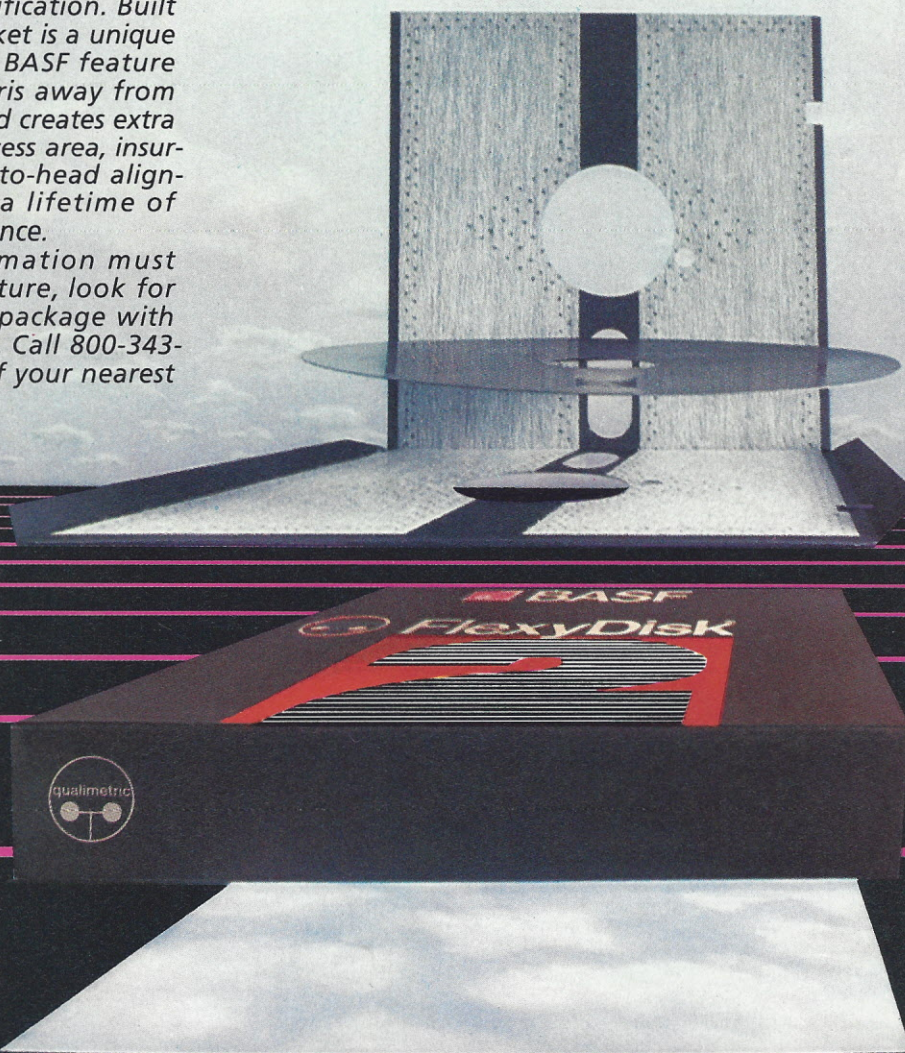
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CIRCLE 91



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DATA BASE POWER

by Charles Rubin, Associate Editor

As a computer magazine reader, you've probably seen the ads for R:base 4000—a series of two-page spreads comparing R:base with another data-base management product whose specifications are suspiciously like those of dBASE II, the leading program on the market. The ads proclaim that while “d old number” of records per data base is 65,535, R:base can handle 100 billion records. The other product's time for sorting 1000 records (“d usual time” is what the ad calls it), is 5 minutes and 47 seconds, while it takes R:base about one minute. The other product's command-entry screen is nearly blank, while R:base's screen is full of prompts that lead you through the command process. These simple comparisons are fairly impressive, but they only begin to convey the power and thoughtful design that is R:base 4000. If R:base doesn't capture a sizeable share of the high-end data-base market, it won't be for a lack of quality or effort.

Meeting needs . . . and more

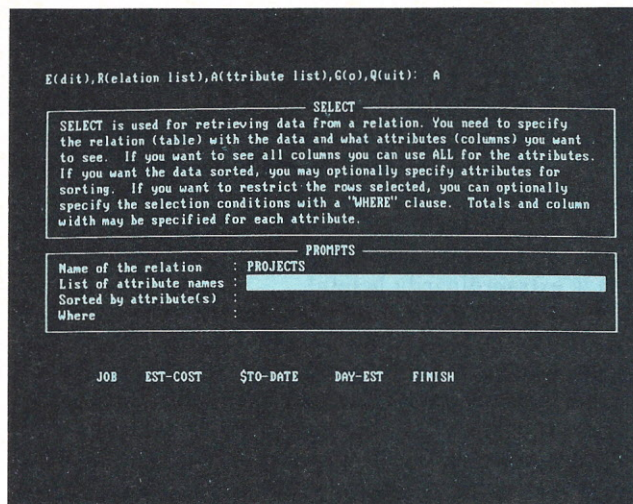
As with any relational data-base management system, it helps to have some prior experience in using such products before tackling R:base. This isn't because R:base is obscure, but rather because it, and other products like it, do so much that it takes some time to really grasp their capabilities. R:base is a relational data-base manager, which means that it can manage several files (up to 40, to be precise) of information at once. Each file in R:base can contain up to 1530 characters. It is difficult to imagine any business or professional situation with information management needs that would exceed these capabilities.

R:base's capabilities allow you to have several different collections of information—say a customer list, an inventory, a payroll list, an accounts receivable file, and an accounts payable file—and enter, sort, or retrieve information from them with tremendous flexibility—and with far less effort than it would take if the files were completely separate. If, for example, you want to enter a customer's order, you can construct a link between the customer file, the inventory, and the accounts receivable file so that entry of the order in the customer file automatically depletes the inventory and creates an entry in the accounts receivable file.

The information would ripple through the various data bases because of the links you had constructed between them. The connections would speed data entry as well. Entering or changing a customer's name and address would only have to be done in one file, because the relationships between that file and other files would automatically cause the data to be added to or updated in every file where it occurred.

Another advantage of relational data bases lies in their information retrieval and sorting power. If, for example, you had 50 or so different fields, or items of information relating to a customer's name, you could retrieve any or all of those items by knowing either the customer's name *or any of the other items*. If you had forgotten a customer's name and address, for example, but knew the amount of the invoice or the date of the transaction, you could use what you remembered to find what you had forgotten.

Understanding these capabilities is half the battle with any relational data-base manager, but many products ask



Microrim's R:base is a sophisticated relational data base which can reference 40 different files at once.

a lot more of you by using dozens of obscure commands and forcing you to refer to a voluminous user manual for assistance. R:base generally tries to make things as easy as possible, whether you're an experienced user or a novice. It uses 39 basic commands, all of which have names that generally describe what they do. To choose information selectively from the data base, for example, you would begin with the command Select. Individual data bases can have ordinary names, like “customers,” and the actions taken are described by verbs and prepositions, just like sentences. To see the whole data base “customers,” for example, you would type “select all from customers.”

R:base's Help facilities come in handy for the novice. In all, there are some 1000 lines of Help information contained in the program. You can load the Help file by simply typing Help at the main program prompt, giving you an alphabetical listing of the R:base commands. The program lets you know you're in the Help mode because the command prompt changes from R> to H>. To get a description of how a command is used, you enter the name

PRODUCT REVIEWS

of the specific command at the H> prompt. By going through each of the commands, you can get a pretty good idea of how the program is operated.

Once you're actually defining and building data bases, it's troublesome to keep referring to the Help file, so R:base has a Prompt mode that walks you through each command you want to perform. Again, the prompt file is quite large, containing about 600 lines of guidance. Typing Prompt Select, for example, takes you into a description of the Select command and a step-by-step series of prompts that elicit the correct input from you. As you answer the prompts, the actual command is built at the bottom of the screen. This has the effect of teaching you the correct command while you're being prompted through it, on the theory that by seeing the actual commands being built, you'll eventually be able to use them directly without prompting.

It will doubtless take some reading of the Help screens and referring to the manual to understand the commands well enough to use even the prompted mode quickly and efficiently, but that's to be expected from a package this complex. For a program in this performance class, R:base 4000 is extraordinarily helpful.

To help you get adjusted to the R:base system, a tutorial booklet is supplied with the program. By following along and using the sample data bases provided on a demo diskette, you get a clear overview of the product in a few hours. The tutorial and demonstration diskette are also sold separately for \$9.95.

As far as data entry aids go, R:base is flexible. You can create as many data entry forms for a relation as you like (each form occupies one screen). Fields are defined by simply moving the cursor to the place on the screen where you want the field to appear, then typing the field name and specifying the length. If you later decide you want to delete a field, or add new ones, you can do this without restructuring the whole data base.

During data entry, R:base offers a variety of ways to insure accuracy. A Check command lets you assign certain conditions to the type or range of data that is acceptable in any field, so that many kinds of errors can be screened out. (Improper numerical formats, invalid ZIP codes, and erroneous state abbreviations are some problems that can be caught this way.) Another way to ensure valid input is through relational validation, in which the accuracy of input into one field is checked by comparing it with data in another data base. If an improper customer number is entered, for example, the program spots the error by checking the customer number against the same information in another data base. The error messages that occur at such times are also user-defined, so it's possible to tell operators exactly what the problem is when they make a mistake.

R:base 4000 will impress seasoned users with its speed

and flexibility in manipulating the information in the data bases. It will sort up to 10 attributes concurrently in ascending or descending order, and will sum the outputted columns at the same time. It allows 16 different conditions (such as Exists, Fails, Greater Than or Equal, and Contains) to be used individually or in combination when searching. Its relational capabilities include Project (where selected attributes are extracted and sorted and then used to form a new relation); Join (where attributes from two existing relations are compared to form a new relation); and Subtract (where a new relation is formed from the differences in attribute values between two existing relations).

If you purchase an optional query interface called CLIO, searching through the data base becomes fun as well as easy. The CLIO interface allows you to identify specific searches with whatever name you choose, and then recall them that way. If salespeople in a company with sales of less than \$5000 per month were defined as Turkeys, for example, you could retrieve a list of them by simply querying, "List the Turkeys," or even "Find Turkeys." When you access a subset of information this way, CLIO remembers what you're dealing with, so you don't have to specify it each time you query. If you ask if there are any Turkeys, for example, CLIO could respond, "Yes." If you then say, "Who are they?" CLIO would automatically know that you are referring to the Turkeys just mentioned. CLIO lets you define as many conditions or relations as you like in this way, and if you forget your definition (ask for Nerds instead of Turkeys, for example), CLIO will prompt you to enter a synonym or correct the spelling. In essence, you can build your own vocabulary that specifies certain collections of data, and CLIO will remember it, thereby eliminating the traditional R:base commands when doing routine searches.

The people at Microrim, makers of R:base 4000, are aiming at new buyers of relational data-base programs, but they're also hoping for a lot of converts from other systems. File-conversion utilities are included with the program to make conversion of records from dBASE II easy. R:base can also access DIF files and Multiplan's SYLK files.

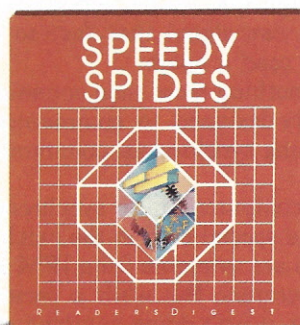
If you've gone through the agony of becoming reasonably proficient with another data-base product, it may not be worth your while to switch to R:base, but the people at Microrim are betting that between the easier interface, higher capacities, faster sorting times, and flexibility, you'll be won over. I wouldn't bet against them.

R:base 4000 runs on the IBM Personal Computer and compatibles with 256k RAM (CTOS and BTOS operating systems versions also available). The price is \$495, the CLIO query interface is \$195.

FOR MORE INFORMATION: MICRORIM, 1750 112th Ave. N.E., Bellevue, WA 98004; (206) 453-6017.



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CIRCLE 68

**WHEN YOU NEED TO DO MORE THAN
ONE THING AT A TIME**

by David Gabel, Senior Editor

When IBM introduced its 3270 Personal Computer, the announcement, both from IBM and the press, was somewhat understated. It said, simply, that the machine could emulate the 3270 family of communications terminals, and that it had windowing capability.

As product announcements go, that was pretty bland, even for IBM. It certainly didn't do the machine justice. Yes, this is a personal computer with a real difference; it offers capabilities that you just can't get with most personal computers. And I didn't realize that until I got a chance to see and work with the machine.

What do you get for your money? Well, when you first see the 3270, you'll think it looks very much like IBM's Personal Computer, but IBM says that about 60 to 80 percent of the 3270 is unique. The features that separate the two machines can be found, for the most part, on the *inside*. There are a few slight differences in appearance, however, such as in the keyboard. The 3270's keyboard resembles the Personal Computer keyboard, but it has a slanting ridge along the top of the keyboard enclosure that contains workstation-control keys—a double row of 24 keys that control things like screen color and window size.

The 3270 runs PC-DOS and uses the Intel 8088 microprocessor, as does the Personal Computer. Thus, says IBM, it can run any program written for the Personal Computer that uses normal BIOS conventions. As if that weren't enough, there's more: It also allows you to talk to an IBM mainframe computer while you're running PC-DOS applications.

That statement, on its face, seems less than overwhelming. I mean, so what? To understand its impact, you have to know that personal computer to mainframe communication isn't easy—there are many problems involved in making the communication possible.

Mainframes speak differently than smaller computers. It's not that they have to, they just do. Long ago it was decided that large computers would communicate with one another at very high speed, because that was the only way that processor throughput speeds wouldn't be degraded with a heavy communications overhead. To talk at these high speeds, there had to be a fair amount of error checking in the communications. As speed of a communications channel increases, the probability that noise in the channel will scramble the information being communicated also increases. So, somehow, the transmitter and the sender have to know what's going on during the communications activity. That was accomplished with synchronous communications, which is very different from the

asynchronous communications many personal computer owners have come to know and love.

In asynchronous communications, data bits get sent out of the computer one at a time. There is usually no effort made to ensure that each bit received is the same bit that was sent. That usually works out alright, because the data is sent at such a low rate that the message usually gets through. At the higher speeds mainframes use, however, communications are synchronized. Sender and receiver agree on the signals they will use to tell one another when a bunch of information is coming. They also send extra information that the receiver can use to determine if the sender's message got through OK. If the message was garbled, then the receiver can signal that fact to the sender, and the sender can send it again.

The 3270 terminals are nothing more than communications terminals specifically designed to communicate with IBM mainframes using synchronous communications.

If you want a personal computer to use synchronous communications, you need a special card in the machine to handle that chore. Cards are available from IBM and a number of other manufacturers. But while a personal computer is communicating, it isn't doing anything else. The 3270 Personal Computer, on the other hand, has the synchronous communications built in, and it can communicate while still keeping track of other tasks.

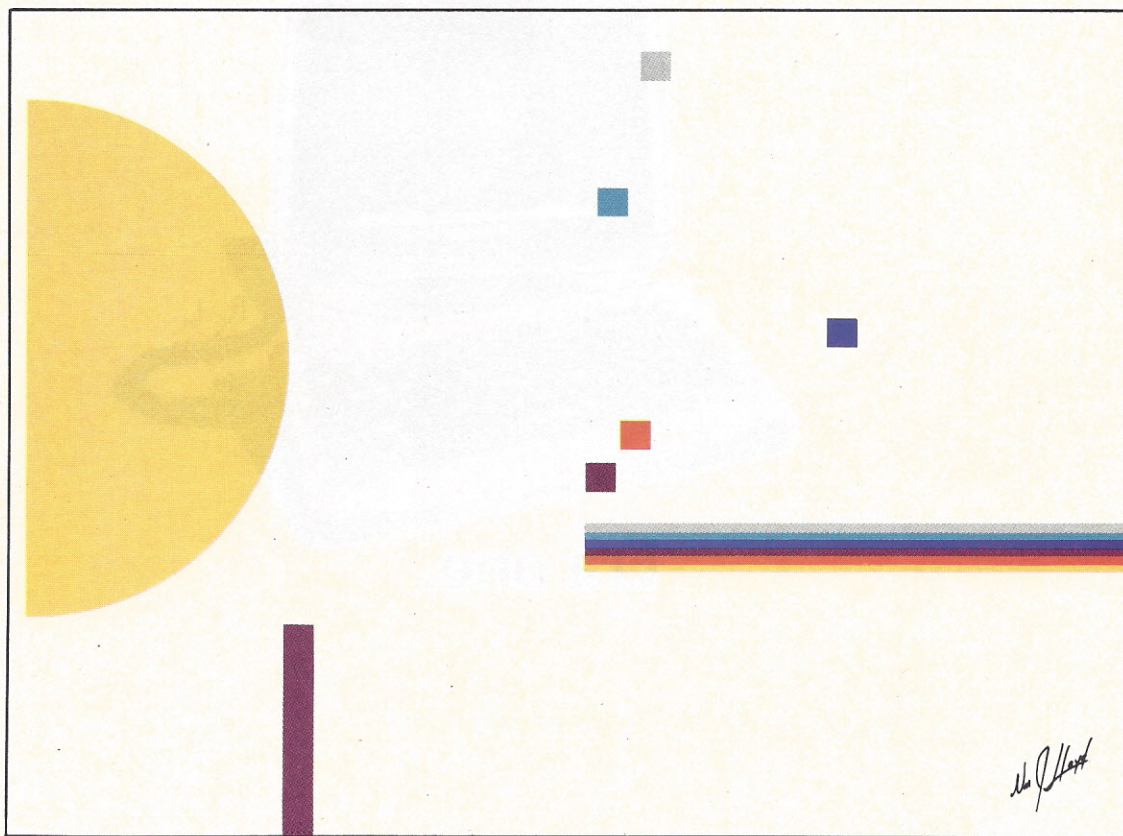
This kind of device is included for people who need more than one computer application. There are some situations, particularly in places like large financial institutions, where you can find two or more 3270 terminals on someone's desk. Why? Because that person needs access to two or more mainframe data bases. Say, for example, he needs continuous data on a national econometric model along with the current financials of a number of companies of interest. This data would be accessed through different mainframe applications, so he'd need at least two 3270-type terminals on his desk. Then, if he wanted to take the data from both applications and put it into a spreadsheet on a personal computer, he'd need the personal computer, too.

Enter, of course, the 3270 Personal Computer. This computer can run four mainframe applications concurrently on the screen, and it doesn't need four connections to the computer to do it. While it uses only one physical connection, it looks like four separate logical 3270 terminals to the mainframe computer, each of them communicating independently.

I saw a demonstration of the 3270 Personal Computer in IBM's New York offices. The machine was connected to a 4300 computer somewhere else in the building, and the way I saw the machine run was the way it would be run if it were on someone's desk.

(continued on page 33)

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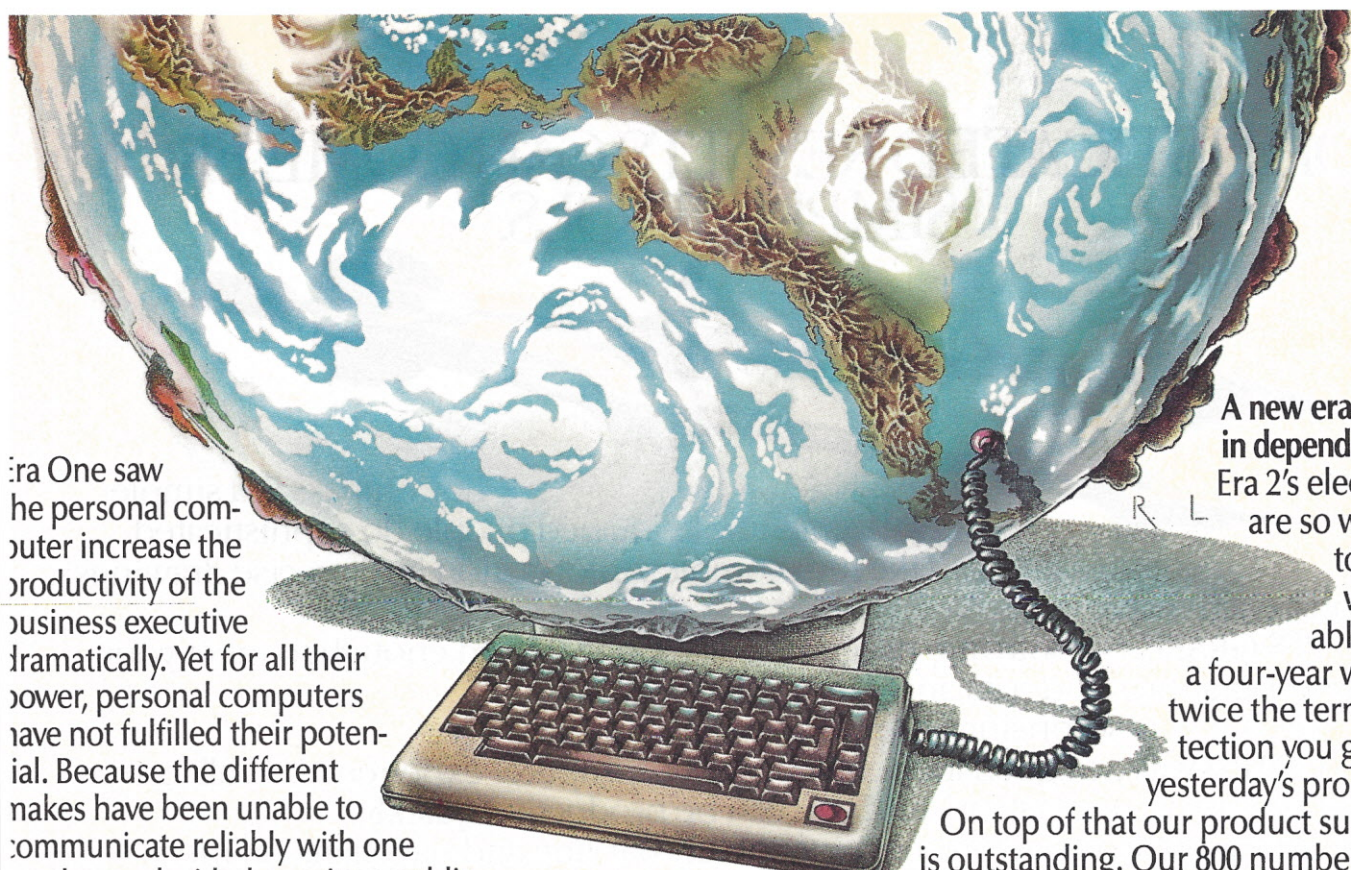
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abc

CIRCLE 60



Era one.



era One saw the personal computer increase the productivity of the business executive dramatically. Yet for all their power, personal computers have not fulfilled their potential. Because the different makes have been unable to communicate reliably with one another and with the various public data networks.

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A closer look at Era 2.

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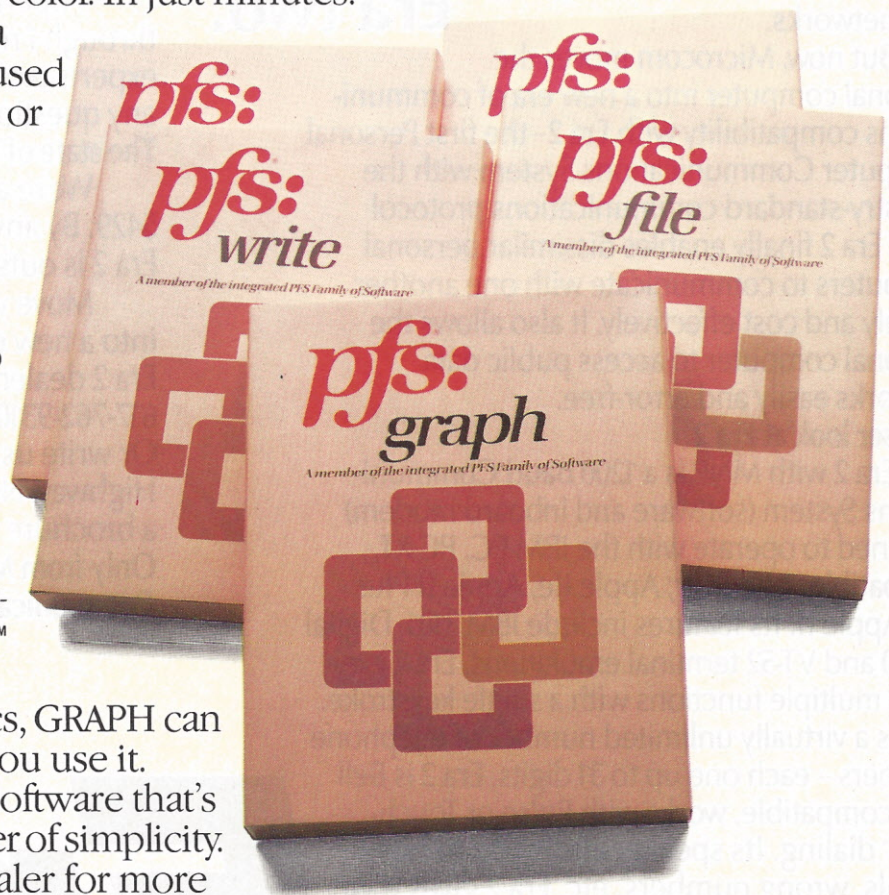
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(continued from page 28)

To bring the computer into action, you just do what you'd do with almost any personal computer: insert a floppy disk and turn on the machine. In the case of this demonstration the floppy disk inserted was the workstation-control program that had been configured for the applications to be run. In normal practice, the computer would be configured by a company's MIS (management information systems) staff for the appropriate applications.

After the computer is up and operating, you can get to any of the applications that have been set up in the configuration. The first application I saw was a simple BASIC program running in a Personal Computer application. The program read the computer's clock, which is set in a DOS boot, and displayed a small clock with the correct time in the upper right-hand corner of the screen. The clock appeared in a window. Then the IBM demonstrator brought up a mainframe application—simply getting some data from a sample file that had been stored on the 4300 computer. We did that by moving to a window that had the mainframe application in it. You get to that window by using the function keys—a Jump key, in this case. Jump moves you from window to window, cycling through all the applications, hence all the windows, that have been defined.

We got the information from the sample file simply by pressing some workstation-control keys. I have to confess that the sequence of keys is a little confusing the first time you see it. It's that way with any computer demonstration. The person running the demonstration knows what he's doing, and by pushing a few keys, things appear on the screen as if by magic. That happened here, and it was sufficient to show the power of the computer. To actually run the 3270 Personal Computer, though, would take some time just for familiarization.

When you want to move to another window, just press the Jump control key to move you through all of the windows until you select the one you want. Then you just press more control keys to make the file download. It's as simple as that. Once you have the file in your computer, you can shift it into the personal computer application to work with it. Suppose, for example, the file were a list of names and phone numbers. You can load that file into a word processor for editing after it's been downloaded from the mainframe.

When you're in a mainframe window you have a lot of options. You can size the window to take a larger or smaller portion of the total screen. You can also change the foreground (the letters on the screen) and background colors. While you can change the size of a personal computer window, you can't change the colors in such an application. IBM assumed that personal computer applications developers used color for a purpose, so they don't




The high-resolution display screen of the new IBM 3270 can be split into windows.

allow the user to change those colors. But you can change the colors on mainframe applications.

Changing the window size isn't accomplished with a mouse as it is on popular personal-computer operating environments; it's done with keystrokes. Pressing a key changes the size of the window in small increments.

All in all, this is a very impressive machine. It solves the problem many have of needing more than one application running at a time, while still conserving desk space. The 3270 isn't for everyone, however. You can't, for example, run a spreadsheet and a personal computer word processor at the same time, for you're limited to one personal computer window. But you can run IBM mainframe programs and any program developed for the IBM Personal Computer that uses normal PC-DOS BIOS conventions. It is a powerful tool for those who need mainframe information and personal-computing power. Price is \$5585 for a basic configuration.

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CIRCLE 76



PRODUCING THE "PERFECT" DOCUMENT

by Jim Keogh, Associate Editor

If you're searching for a low-cost, letter-quality printer, you should take a close look at the Smith-Corona L-1000. For \$545, this daisy-wheel printer combines the efficiency of word processing with an affordable way of producing the "perfect" document.

The L-1000, which was once called the TP-II Plus, is classified as a fully formed character printer. With its 12 characters per second output, you won't break any speed records, but some of the other features of this printer more than make up for the lack of speed.

For one thing, the L-1000 is compatible with either an RS-232-C or a parallel printer interface. To help speed the printing process, the printer features a buffer which holds 570 characters (about the size of a normal business letter). The document is loaded from your computer's memory and stored in the printer's buffer memory, so that once the document is loaded, you and your computer are free to prepare the next document while the first is printing.

You can also control the line spacing of your document from the printer, as opposed to controlling the spacing from your word processor. You can choose 3, 4, 5, or 6 lines per inch by flicking a lever on the top of the printer. You'll find that this can be a time saver if you misjudged the line spacing when you were preparing your document.

The L-1000 also allows you to control the pitch (spacing between characters). You can select 10, 12, or 15 characters per inch by pressing a switch on the control panel on the front of the printer.

Automatic underlining

By inserting special print command codes in your document, you can have the L-1000 automatically underline characters. The instruction booklet that comes with the printer shows you which codes you'll need to activate this feature.

The L-1000 comes with a 28-page booklet complete with character set tables, control code listings, and descriptions of the parallel interface and timing. The booklet also shows you the various ribbons and print wheels that are available.

One of the better features offered on the L-1000 is the ease with which you can change the ribbon. The L-1000 uses cassette ribbons that slip into the printer. You never touch the ribbon itself. And Smith-Corona lets you add color to your documents by offering ribbons in red, blue, brown, and green, as well as black. Three styles of ribbons are available for the L-1000: one-time black carbon film (\$3.50), multistrike black carbon film (\$8.50), and nylon fabric (\$4).

Smith-Corona also offers a variety of print wheels for



The new Smith-Corona L-1000 offers letter-quality printing with a variety of fonts at a reasonable price.

use with the L-1000. Besides the traditional pica style, you can purchase print wheels that let you print in script or other styles. And there are print wheels specially designed for printing documents in a foreign language. With the proper print wheel, the L-1000 can handle documents written in French, German, Dutch, Spanish, and Finnish. The print wheels cost about \$8 apiece.

Changing a print wheel takes less than a minute. All you do is remove the ribbon, retract the print hammer, and pull off the print wheel. The new print wheel snaps into position. Once the hammer is positioned and the ribbon installed, you're all set to continue printing.

The L-1000 can be used with either single-sheet feed or continuous tractor feed. The tractor feed mechanism is an option that is necessary if you are using continuous paper feed. When we tested the L-1000, we tried to get by without the tractor feed, but every time we printed a few pages, the paper skewed, forcing us to stop printing and adjust the paper.

The sound barrier

During our test, we operated the printer in a small office. The L-1000 was noticeably louder than any dot-matrix printers that we have in the office. Under our test conditions, we found it difficult to run the printer and talk on the phone at the same time due to the noise.

The L-1000 printer, which weighs about 21 pounds, is 6.4 inches deep by 19.5 wide by 13.5 inches long, and fits comfortably on any desk top or printer stand. It's ideal for use at home, and also well-suited to a small business that doesn't need to produce a steady stream of letter-quality copy. If you're looking for an economical way to produce a letter-quality document and speed is not critical, I think you'll find that this machine's overall performance will meet most of your needs.

FOR MORE INFORMATION: SMITH-CORONA, 65 Locust Ave., New Canaan, CT 06840; (203) 972-1471.



A SPREADSHEET WITH SOMETHING EXTRA

by David Gabel, Senior Editor

All spreadsheets are not created equal. There are bare-bones spreadsheets that allow you to enter data and do some calculations. Then there are super-fancy spreadsheets that permit some data-base management capability and graphics along with the spreadsheet. There are even some programs that are primarily data bases with some spreadsheet capability. One program I've reviewed in the past lets you put a spreadsheet any place in any kind of document you want, but it's really a document manager.

SuperCalc 3, on the other hand, is a good spreadsheet with something extra—well, two things extra, really. It makes a graph of your spreadsheet quick as a wink, and it has a macro-instruction execution capability that's really something to watch.

But first things first. SuperCalc 3 wasn't my first SuperCalc experience. I had run a version of the original on my Apple under CP/M, so I had a little familiarity with the command structure of that earlier program and the way it looks. Happily, the SuperCalc 3 program I had, running under MS-DOS on a Panasonic Senior Partner computer, looked the same. Its command structure was basically the same also, with some additions.

Working with a spreadsheet takes a little getting used to. It isn't hard, mind you, just different. SuperCalc, like many spreadsheets, presents you with an almost-blank screen when you start out. The only thing you see is the border along the top and the left side of the monitor. In the border are row and column designations. The columns are lettered—A, B, C, and so forth, all the way to BK. The rows are numbered, 0 to 254. The places where rows and columns intersect are called cells. A cell can contain

a value or textual information. The value, if there is one, can be a constant that you enter from the keyboard, or it can be a computed value. In the latter case, you enter the formula for computation with the cursor located in that cell space.

In this case, I decided to test SuperCalc 3 by building a very simple model of a sales budget. I didn't include costs, just the sales figures I expected to get from a mythical sales staff in four different regions. I thought I'd do the model for just one quarter, because that should do everything I needed to see how the program works. So I moved the cursor, which showed up as a wide inverse-video area in cell A1 when I first started the spreadsheet, to column C and entered the title of my spreadsheet.

Any time you want to enter textual information into SuperCalc, you have to start the phrase with a quotation mark. If there's any other kind of letter or number, the program will try to interpret it as a formula or as a command. I discovered this very quickly—things just didn't seem to be working right, so I scanned a small menu at the bottom of the screen, which said that pressing F1 would get me to a Help screen. When I pressed F1, I was presented with a screen that explained how to enter information into the spreadsheet. Pressing the space bar (any key will do) got me back to the spreadsheet.

Back to my model. I entered the title into C1. Of course, I hadn't set any column widths as yet, so the name of the spreadsheet was longer than the cell width. That's no problem with SuperCalc 3, however. Providing that there's no information in the cell to the right, the program will display whatever information you enter, no matter how wide. In my case, the columns were set to the default column width of nine spaces, but the title, Sales Budget, was 12 spaces wide.

Building a model

I moved on. I decided to put the names of the four sales regions (imaginatively titled Region 1, 2, 3 and 4) down the A column, under a column title called Item. So I used the arrow (cursor-control) keys on the Senior Partner's keyboard to move the cursor to cell A6 and started entering the regions. After completing the first one, I hit Return, and that automatically moved the cursor down one space. Any time you terminate a cell entry that way in SuperCalc 3, the cursor automatically moves one space in the direction you were going when you got to the cell in the first place. For example, I moved from A5 to A6 to make my first sales-region entry. That was a vertical move downward. After I entered the region title and hit Return, the cursor automatically moved to A7, and the program was ready to take the next entry.

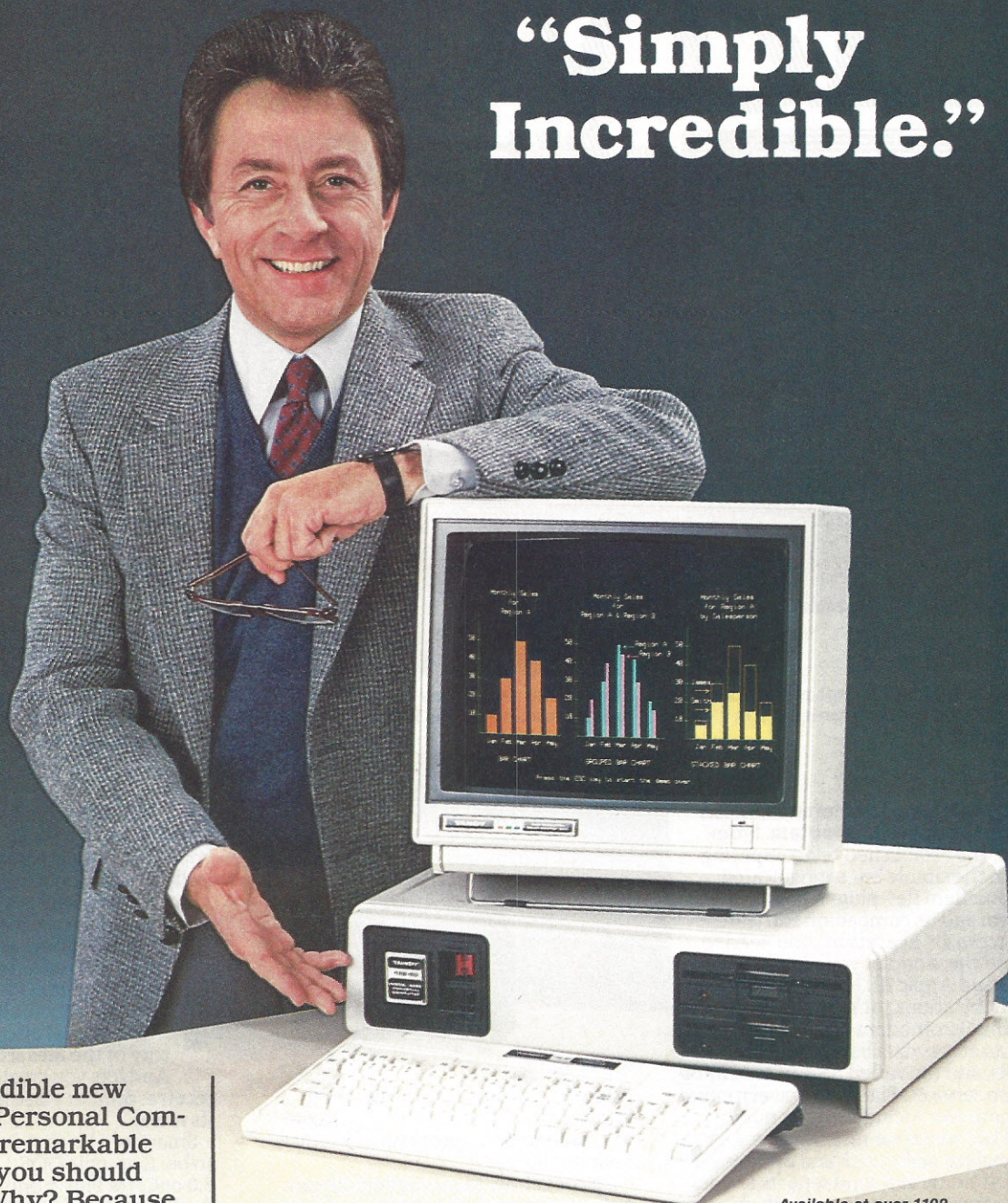
So I finished the first column and moved on to column B. Here I just entered the month Jan in the row on top of the column, and then made up mythical sales figures for

	A	B	C	D	E
1					
2					
3					
4					
5	Item				
6	Sales region 1	112000	113120	114251	339371
7	Sales Region 2	125000	126250	127513	378763
8	Sales region 3	131000	132310	133633	396943
9	Sales region 4	123090	124321	125564	372975
10	Total	491090	496001	500761	1488052
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Model of a sales budget created with SuperCalc 3. If changes are made, the program will recalculate the figures.

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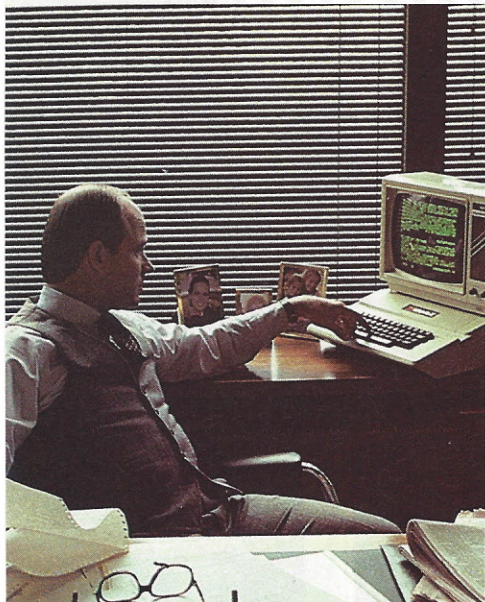
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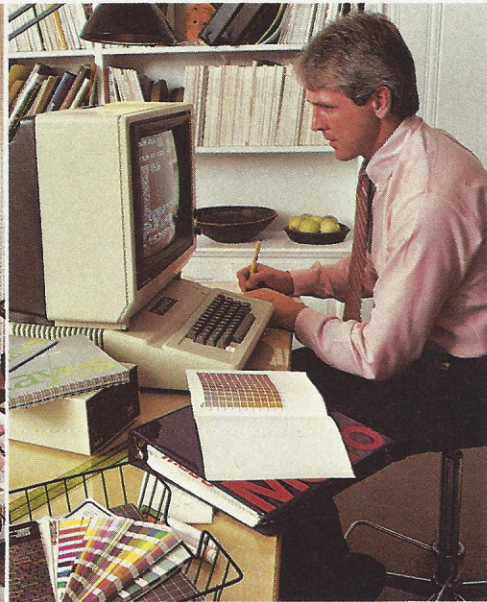
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each region. I entered these figures down the column, with the cursor automatically advancing as before. Now it was time to do some calculations.

I assumed that every sales region would increase sales by 1 percent each month. So I moved the cursor to cell C6, the first entry in the month of Feb, and entered a formula. There's no need to precede formulas in SuperCalc 3 with plus signs, as there is in VisiCalc. If you start with a letter, as I said before, then the program assumes you're entering a formula. So the formula was simply $B6*1.01$. The result of the calculation appeared immediately.

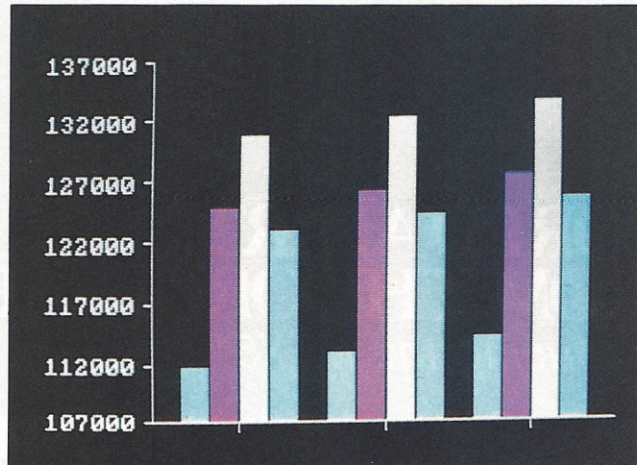
Since I was assuming that each of the sales regions would have the same rate of growth, all I needed to do for the other cells in row C was to replicate the formula in C6. I accomplished this with the /R (replicate) command. If you use this command with no options, the program assumes that you want the cell values adjusted to account for their new locations. It works like this: I had the formula $B6*1.01$ in cell C6. I wanted to copy this formula to C7, C8, and C9. So I used the /R command, and SuperCalc asked what the source range was. I hit Return, indicating the source to be C6, since the cursor was sitting in C6. Then the program asked for the destination range, and I entered C7:C9. Any time you want to indicate a range of cells, you enter the first cell in the range, followed by a colon, followed by the last cell in the range. SuperCalc then asked for options, and I hit Return for the default replication. The formula was copied into the destination range, but in cell C7, it was changed from $B6*1.01$ to $B7*1.01$. The cell in the B column was similarly adjusted for all the cells in the destination range.

I could have used any of a number of replication options. I could have told the program not to adjust the multiplicand values, or to ask whether each value should be adjusted. In this way you can use one cell value as a constant for calculation in other cells if you choose. Or I could have just copied the value in C6 into the other cells, rather than the formula.

At any rate, I had now completed column C, and I saw that I had a problem. The spreadsheet didn't look neat—the columns weren't justified under the column headings, and the B column was too close to the region titles in the A column. I fixed that using more / commands.

The /F command lets you format your columns and rows. I wanted the top row, with the month labels in it, to right-justify with the numbers below it. So I used /F,R (for Row), 5, (the row number) and TR (for text right). Row 5 was right-justified. Then I used /F,C,A,12 to set the column width of column A to 12. You can set each column in SuperCalc 3 to its own individual column width.

Now I went back to finishing the simple model I was building. I replicated column C into column D by repli-



SuperCalc 3's graphics capabilities let you create pie charts and bar graphs from data you've built into spreadsheet models.

cating the formula in C6 to D6 and then replicating D6 to D7:D9. Now I wanted a quarterly total, so I went to column E and entered another formula in E6; $SUM(B6:D6)$. That totaled the figures in row 6. I replicated the sum down the E column, and added another sum at the bottom for a grand total. Then for good measure, I used a repeating label, by preceding the label with an apostrophe, to draw a double line at the bottom of all the columns, and used the sum formula to add up the columns. This gave me a total of all the sales for each month.

Worth a thousand numbers

You can draw a picture of your numbers with this program. Now this isn't the only spreadsheet that lets you do that. The one other that I have used is 1-2-3 from Lotus Development. I have to say that using the graphics in 1-2-3 is a little difficult, but graphing from SuperCalc is easy. It seems, well, more intuitive. At least it was easier for me.

To draw a graph, you simply use the /V (for view), command. There are a lot of graphics options, all carefully explained in the user's manual, which is, by the way, very thorough and complete. It was a joy compared to the documentation for the SuperCalc I used on my Apple. At any rate, you can get as fancy or as simple as you want with the /V command. All you need to do to make a graph is type /V,D (to define the range of data to be graphed) and then a data range, like B6:D6. A small menu line on the bottom of the spreadsheet screen tells you that pressing F9 gives you a view of the graph. If you just enter a data range, like I did, and then press F9, you get a simple bar graph of one variable.

After I did that, I decided to get fancy. I used the /GG (global, graphics) command to set up the graph parame-

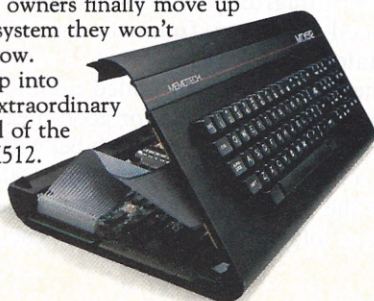
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ters. This command shows you a set of parameters with which you can customize the graph—put a box around it, add a grid, or tick marks, and a lot more. Then I used the /VG command to select a different type of graph. I picked a stacked bar graph, and defined different variable ranges for variables A, B, C, and D. Variable selection proceeds as an option of the /V command. After I'd selected different variables, I pressed F9 and voila, there was the stacked bar graph.


All at once

Finally, I got away from the graphics and decided to look at the program's macro capability. To demonstrate this capability, I used the /X (for execute) command to execute a measures-conversion macro Sorcim (SuperCalc 3's publisher) provided. (This macro file is on a separate disk and is sold separately.) The full command was /X,B:Conversions. The macro file Conversions loaded from disk drive 2 and executed. I could see what was happening on the command line as command after com-

mand automatically executed. Finally the whole thing was done, and I had a menu for conversion tables for weights and measures on the screen. To convert from grams to pounds, for example, I simply moved the cursor to the appropriate table on the menu and pressed &. The conversion table loaded. I went to the grams column and entered the number of grams to be converted at the top, and the pounds were updated in the column underneath.

All in all, I was impressed with this program. I had it going after about 10 minutes of playing around, getting used to both the program and the computer I was using. If you've used any spreadsheet before, I'm sure you could get this one going in the same amount of time. And you won't really have to consult the manual to do simple stuff; the Help screens and the prompts will provide all the help you need until you get fancy.

SuperCalc 3 runs on the IBM Personal Computer and compatibles and costs \$395.

FOR MORE INFORMATION: SORCIM CORPORATION, 2310 Lundy Ave., San Jose, CA 95131; (408) 942-1727. 

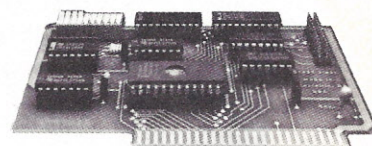


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Computer Power In Reserve

Because of the rising use of personal computers and computer-based devices among its customers, the Potomac Electric Power Company (Pepco) may soon offer a special Reserve Power Service which, for a monthly service charge, would protect those customers against power surges and losses.

To gauge potential customer interest in such a service, Pepco, which serves the District of Columbia and parts of Maryland and Virginia, mailed a questionnaire last November to 10,000 of its customers thought to be using computers or computerized equipment.

The questionnaire contained over 20 questions on home and business computer use, and asked for information such as what the computers or devices are used for, and how frequently they are used.

The responses reflected Pepco's concern that power outages are more frequent in rural and suburban areas, since most of the interest in a service providing backup power came from rural and suburban customers, and not from people in downtown areas.

A. Michael Maher, department manager for Pepco's Energy Management Development department, a research team, voices the frustration

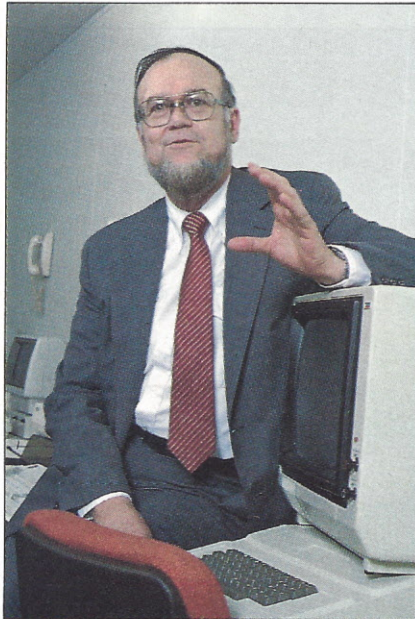
of many personal computer users who lose files they are working on if the power goes out. "I have a personal computer at home with a surge protector, but I don't have back-up power," says Maher, who lives in the suburbs. "If the power goes out for a couple of seconds while I'm in the midst of trying to figure something out and it's been 20 minutes since I saved, all of a sudden that 20 minutes of work is gone. Worse than that, my mind goes blank, and it's tough to recon-

struct what I did," he says.

The idea for the Reserve Power Service, part of a Pepco plan to provide a "menu of services" for its customers, has to go through many steps before it becomes a reality. First of all, Pepco has to decide if it's feasible as far as marketing goes. Then they must present their plans and rate proposals to the three separate public service commissions that govern their service areas. The commissions must approve the service and the rates before Pepco can offer the service.

If it is offered, Pepco's Reserve Power Service would protect against power fluctuations and provide battery backup of the line power through the use of an Uninterruptible Power Supply (UPS) device. The UPS device would be connected to the computer equipment, and would be maintained and serviced by Pepco as part of the monthly service, which, for most users, will cost between \$10 and \$34 a month, according to tentative figures.

The protection against power fluctuations is the same protection as that offered by surge protectors sold at computer stores. These devices keep the power flow consistent, so that sudden surges or drops in power won't garble or destroy data. Pepco's UPS device would go further than surge protection, however, by giving users 10 to 30 minutes worth of battery power if line power goes out



Pepco's A. Michael Maher is part of a research team looking into protecting customers against power fluctuations.

Photograph by Gwendolyn Stewart

completely. This would give personal computer users time to save any files they were working on when "the lights went out."

Pepco's power usage statistics say that a typical personal computer running disk drives and a printer would tend to use about 250 watts, which would cost \$16 a month according to the tentative rates. Personal computer users can save even more by not hooking up a printer—wattage use drops to 100 watts without a printer, making users eligible for the tentative \$10/month service rate. Maher points out that you don't really need to hook up your printer to the service, since your main goal is to protect what is in the RAM of the computer.

Pepco is apparently the first public utility service to be actively considering a Reserve Power Service for use with personal computers and small computerized systems, such as typesetting equipment and cash registers. Maher says, "We are not aware of another utility doing this," and he explains that the service is intended for use with computers or devices us-

ing less than 3 kilowatts of power.

Does Maher think that other utilities across the nation will soon be offering the service? "If customers like it," he says, "I see no reason why other utility companies wouldn't pick it up." As more and more computers and computer-based devices find their way into businesses, schools, and homes across the country, other utility companies might focus their attention on the desire for such a service.

TV-Soap Actress Is Starstruck By An Apple

Writing to famous people can be a disappointing, and even frustrating experience. Often, you have to join a fan club, which usually involves paying a membership fee. Even then, getting a response isn't guaranteed.

But then, to be fair, let's look at the problem of fan mail from the celebrity's point of view. Frequently, the adoring (and not so adoring) fan mail

arrives in such volume that even the most diligent of notables would have a hard time just keeping tabs on what comes in, much less answering it all. So the task of dealing with a flood of mail is delegated to a secretary or outside organization, if the task is taken on at all.

Candice Earley, one of the stars of the daytime soap opera "All My Children," takes a different approach. Earley, who portrays the character of Donna Beck Tyler Cortlandt (by two marriages) on the popular ABC-TV drama, keeps track of and answers her own mail with the help of her business manager/mother Jean Earley and a couple of Apple IIe personal computers.

"I know there are some people who hire secretaries or who have fan clubs to deal with (mail), and maybe there are some people who don't respond at all," says the native Oklahoman, a pretty blue-eyed blonde. "I've tried fan clubs, and they've just never worked for me. Just to be able to write to me, I don't think you should have to pay \$20 a year (in fan club membership fees). I really believe, and this sounds so Pollyanna, that if it were not for these people I wouldn't have a job—not me specifically, but if people didn't watch television, advertisers would have no place to go and we wouldn't have a show. So I think it behooves me to keep in touch.

"Besides, it's an ego boost," she admits with a bit of laughter in her voice. "I love hearing nice things. And getting (viewer) comments, their feedback—even when it's not positive—is good for me. It's just interesting to hear what they have to say."

Hearing what all the people who write her have to say (the list is now several thousand names long) and sending them letters, autographed pictures, and announcements of various kinds is an information management project that Earley found ripe for a personal computer. Equipping her mother, who still lives in the Ear-



Photograph by Michael Mella

Candice Earley, one of the stars of the daytime soap opera "All My Children," uses an Apple IIe personal computer and PFS:FILE to keep in touch with her fans.

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CIRCLE 88

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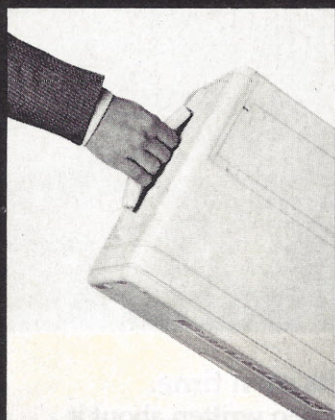
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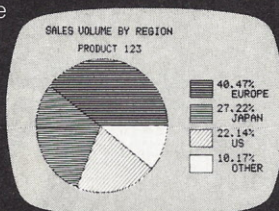
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leys' hometown of Lawton, Okla., with an Apple II Plus (and later a IIe) and PFS: FILE, the actress was able to create a system of communicating with her fans while easing her mother's burden of keeping up with the mail.

"I thought she had too much to do," Earley says, "and it distressed me. She was dealing with, at that time, I guess it was almost 2000 fan letters. It was nice that she had been willing to take over my business affairs, but I didn't want to run her out of her own home with all the paperwork."

Typically, when the soap opera star receives a fan letter at ABC-TV studios in New York, she forwards the mail to her mother, who enters the correspondent's name and address into the computer. A form letter and signed picture of Earley are then sent off to the admirer. But Earley's communication with those who write to her doesn't stop there. She also uses her data base of followers to sort through addresses, usually by area code, to let fans in a given part of the country know that she'll be appearing in a nightclub, play, or publicity spot near their home. Mailing out these kinds of notices to fans, Earley feels, is a nice little extra for both her and her supporters.

"I think it works well for everyone involved," explains the veteran of Broadway plays such as "Grease," "Jesus Christ Superstar," and "Hair." "For instance, two summers ago I was in Ohio doing summer-stock, performing in (the play) 'Gigi,' and we went into PFS and pulled up the area codes of all the people in a 100-mile radius from the two towns where we'd be playing. And then on Applewriter, we drafted a form letter to them saying, 'I'll be here doing 'Gigi,' and these are the dates, and I hope you can come to see it.' That was exciting to see the computer could do that so easily."

In addition to appearance notices,

Earley also sends Christmas cards and a yearly newsletter to everyone in her fan file. And while her mother still takes charge of most of the day-to-day work involved in logging in the mail and sending out letters, Earley keeps a close watch on what's going on with her fans with an Apple IIe of her own.

"It just looked like a lot of fun," she says of her reason for adding a computer to her Manhattan duplex. "And we thought it would be good for me to be able to keep track of things, as well. I visit home quite frequently, so I just take my disks with me and we update them."

Besides staying on top of her fan mail, Earley and her mother use their computers to organize the business side of her career—incorporated under the name Great Plains, Inc.—with much of her financial information entered into programs like The Home Accountant and Multiplan.

A big part of that career, when she can get away from "All My Children," is returning to her first love: singing. A student of classical voice and musical theatre, Earley says the computer helps her sort through "thousands of pieces" of sheet music. She enters the music titles into PFS and takes orders for her recently recorded "Songs from Le Chateau," a four-song album named after the fictional soap opera nightclub where daytime viewers can hear her sing. Earley is even able to keep track of what outfits she has worn at a particular place and at a given time, noting that it's important for a performer not to "repeat herself" even where fashion is concerned.

Business uses aside, Earley confesses to being "a big fan of Deadline and Enchanter" adventure games, although she's not enamored with arcade-style software games. ("I'm just not adept at them.") She also spends some of her "five or six hours a week" at the computer teaching herself a little about programming

and graphics and browsing through the CompuServe information service. Her work at the computer has raised more than a few eyebrows both with her colleagues at work and her fans.

"My actor friends are kind of thrown into shock," Earley says. "I guess I just don't strike them as the kind of person who would be interested in computers, much less in keeping track of fan mail that way. But they think I'm a pretty clever girl for doing it. The people who write to me are astounded by it, too. I think it's just a fun thing all around."

But what would street-wise Donna Beck Tyler Cortlandt, her television character for eight years, think? "I don't think Donna would use a computer," Earley notes pensively. "She has no aptitude for it. She can't even run a cash register. So as far as that goes, we're not too terribly alike."

Continuing Your Education At Home

As an alternative to attending classes, TeleLearning Systems of San Francisco, Calif., offers a new way to further your education—taking courses at home via your personal computer and a modem. TeleLearning has 170 courses to choose from, and you can hook up to any one of them for a one-on-one learning experience with that particular class's instructor. In addition to its own course offerings, TeleLearning sells its network service to the military, schools, and corporations, allowing them to develop their own courses for use on it.

The courses offered directly from TeleLearning range in price from \$35 to \$150 depending on the course, the number of sessions it runs, and the credentials of the instructor. As for the level of the courses, they range from individual tutoring programs in reading and math to SAT (college

(continued on page 52)

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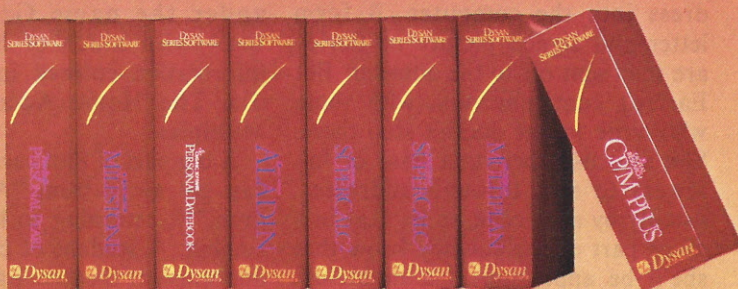
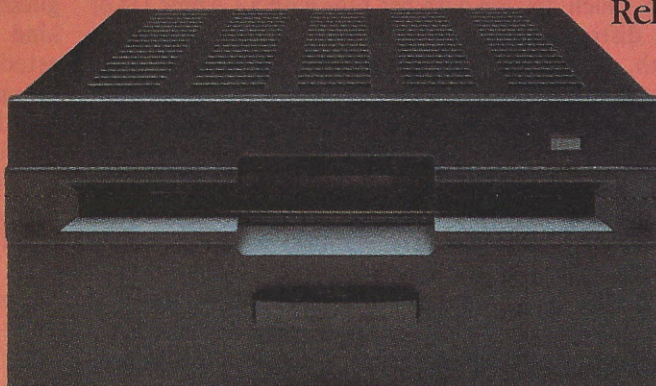
And our 3 $\frac{1}{4}$ " Flex Diskettes are packaged with hard plastic carrying pouches that hold and secure as many as five diskettes. So you can carry your work home. Or mail it across the country. Safely.

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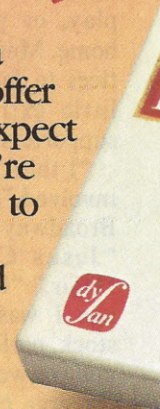


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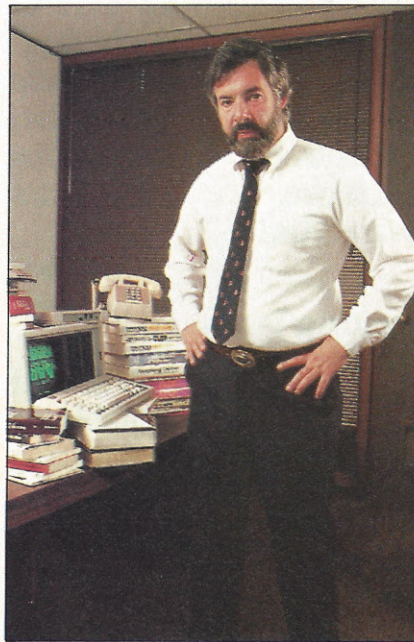
entrance exam) test preparation, to college level classes that help students prepare for CLEP and ACT exams (allowed as substitutes for college credit in many universities), to professional test preparation courses.

In addition to these, TeleLearning offers a potpourri of courses for such diverse interests as computers, the arts, fitness and recreation, business management, career development, investments, personal growth, and parenting. Some business titles are: Motivating Employees, Techniques for Managers; Planning Cash Flow; Getting What You Need: How to Negotiate Anything; and Effective Business Writing Skills. Recreation and leisure titles include: Bicycle Maintenance and Repair; and First Aid for the Weekend Athlete.

Former Atari president Ron Gordon is chairman of TeleLearning Systems, which was founded about a year and a half ago. The company wanted to find a way to teach people at home via their personal computers. While the concept of an "electronic university" was not new, and had been attempted by several universities, its applications were limited and there was no commercially viable way to make it happen on a grand scale because of numerous technical and marketing problems.

Gordon says one of the technical problems was that the modem technology which existed at the time was inadequate, for three reasons: 1) modems were too difficult for the average person to use, 2) the purchase prices for modems and communications software were too high, and 3) the line communications costs were too high. To solve these problems, TeleLearning developed a hardware device with accompanying software.

The hardware device looks like a modem, and plugs into the computer. With the device, purchasers also get communications software, registration into the "university," and "educational environment" software. (If



Ron Gordon has made the "electronic university" network a reality offering over 170 courses to further your education.

you already have a modem, you can use it and just buy the software needed.) The "educational environment" software, says Gordon, "presents the structure that courses fit into." All of this costs from \$150 to \$230, depending on your system. "The hardware and software represent a technology breakthrough as far as reduction in cost and simplicity are concerned," claims Gordon.

"We've simplified communication methods for the user," says Gordon. "Now he pushes one button, and all handshaking and protocols are done automatically. Because of this and because text information is compressed into coded format, the communications costs are less." In fact, TeleLearning reduced the communications costs so much, these costs are included in the prices of their courses—users pay nothing extra for phone time.

The TeleLearning system gives students a choice of either electronic mail or "live" lessons. Lessons can be sent back and forth between student

and teacher mailboxes, and time for "live" lessons can be arranged by a student and his teacher. You are not on-line all the time during a live lesson; only when you actually press the button to send or receive information, another factor that lets TeleLearning keep down communications costs.

TeleLearning's teacher pool for its own courses includes professors and assistant professors from colleges and universities, as well as handicapped teachers and teachers from the Association of Retired Teachers.

As for the schools and corporations who hook into TeleLearning's network, they are free to set up their own courses with their own fees. "We're not limiting this to courseware we make," says Gordon. "Anybody can devise software to go on this network, and we are encouraging it. When we sell to corporations or universities, we only provide the network services and devices; it's up to them to set fees for their courses."

American Management Associations, with headquarters in New York City, is an organization that provides educational services to its members. AMA is one of the professional societies who will work with TeleLearning Systems to offer professional education courses to its members using their home computers.

According to Ron Malis, vice-president of development for AMA's extension institute, the courses being produced by AMA are adaptations of courses which have already been produced and marketed in print format. Malis sees the electronic university as a natural extension of its correspondence courses.

Malis does not think electronic universities will replace correspondence courses, though. "People have different needs. Some may feel comfortable with a computer, some may not. This new system is an attempt to answer a market need, and I don't think any particular technology will replace any other; I expect they

will all work together," he adds.

One of the more far-reaching parts of TeleLearning's plan is the arrangement planned with universities across the country to let them offer their actual credit-earning courses on the network. This arrangement will take some time to develop, but courses offered this way will not conflict with the courses offered directly from TeleLearning. "We have no intention of becoming an accredited school ourselves," says Gordon, "because we are working with many schools and want to be a complement, not a competitor."

On March 8 of this year, TeleLearning announced a breakthrough: The enrollment of a student in the first fully credited college course to be taken on a home computer. The student, confined to a wheelchair, enrolled in and will be taking courses toward a BA degree from Ohio University. Seven other schools—San Diego State University, New York Institute of Technology, University of Nebraska, University of Wisconsin, DeAnza College, Thomas A. Edison State College, and American Open University—are planning to offer credit courses on home computers through TeleLearning.

TeleLearning also announced plans to offer two certificate programs—one for middle managers, the other in secretarial and clerical skills—from accredited colleges. These programs will consist of 12 units from accredited colleges, and courses in the two programs will cover such topics as word processing, data base management, electronic mail, accounting packages, and spreadsheets.

Scheduling can be a problem in any academic arrangement, and the system has not been free of its own scheduling troubles. Gordon admits that one of the problems in the pilot programs was that of either the student or the teacher being absent during live communication lessons. This is why the company has the

users—teacher and student—set definite times for live communication sessions.

The live communication sessions allow the student-teacher interaction that Gordon feels sets the TeleLearning System apart from correspondence-type courses. "The purpose of our instruction is like a traditional school environment where you have a teacher to motivate and direct you," says Gordon.

Gordon emphasizes the importance of student/teacher interaction through the computer, pointing out as an example the instance of a student making a mistake, and getting immediate feedback from the teacher. "A private instructor who can tailor learning to your needs; that's the essence of TeleLearning."

Right now the hardware and software needed to take TeleLearning courses can be used with the IBM Personal Computer, the Apple II series, and the Commodore 64. TeleLearning also hopes to make the equipment compatible with Atari and TRS-80 computers by early spring.

Aiming at four basic markets—consumers, schools, corporations, and the military—Gordon says TeleLearning Systems expects to have 100,000 users from the consumer market alone in 1984. These sales will be through computer stores where retailers will have an incentive to sell courseware: After selling the initial hardware and software to a consumer, the retailer gets a 10 percent commission on all courses the student purchases from TeleLearning.

For Gordon, TeleLearning's electronic university represents a real breakthrough in the use of home computers. "We feel this is the first major use of home computers other than games. It will become one of the most important, continuous uses for the home computer, because the whole family can continue their education at home."

Participating In A News Story

Mike Greenly is a reporter. And when he goes on location to cover any of a number of computer shows held each year, he brings his readers with him. A self-proclaimed pioneer of a new form of journalism called "interactive electronic journalism," Greenly reports the latest news to his readers who, via The Source, have hooked up to a "conference" ser-



Photograph by Andrew Popper

After Mike Greenly covers a computer show, he sends his readers his report via his TRS-80, modem, and a pay phone.

vice called Participate—Parti, for short.

Parti is just one of a number of communication services offered by The Source, and it's designed to let people receive information and communicate electronically through data terminals and/or personal computers. The conferences can be prearranged to deal with any specific topic, and can be public by inviting open participation, or private by requiring a password for anyone who

(continued on page 56)

The TeleVideo IBM PC

The best hardware for



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With the TeleVideo® IBM Compatible line—PC, XT and portable computers—you'll get the most out of all the most popular software written for the IBM® PC—more than 3,000 programs.

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THE BEST HARDWARE FOR THE BEST PRICE.

Features	Tele-PC	IBM PC	Tele-XT	IBM XT
Monitor	YES	OPTIONAL	YES	OPTIONAL
Screen Size	14"	12"	14"	12"
Tilt Screen	YES	NO	YES	NO
Quiet Operation	YES (NO FAN)	NO	YES	NO
Memory	128K	128K OPTION	256K	256K OPTION
Graphics Display (640x200 resolution)	YES	OPTIONAL	YES	OPTIONAL
Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communication Port	YES	OPTIONAL	YES	YES
MS™DOS/BASIC®	YES	OPTIONAL	YES	OPTIONAL
System Expansion Slot	YES	YES	YES	YES
RGB and Video Port	YES	OPTIONAL	YES	OPTIONAL
Typical System Price	\$2995	\$3843	\$4995	\$5754

compatibles. the best software.

and has the standard—not optional—features you need to take full advantage of every job your software can do.

Study the chart at the left. It proves that TeleVideo—not IBM—offers the best hardware for the best price.

Note that TeleVideo's ergonomic superiority over IBM extends from fully sculpted keys and a comfortable palm rest to a 14-inch, no glare screen that tilts at a touch.

THE BEST MICROCHIPS.

What is perhaps most impressive about the TeleVideo IBM PC Compatible can be found deep within its circuitry. We use the same 8088 central processing unit that runs an IBM PC. But we also employ new VLSI (Very Large Scale Integration) microchips that are designed and built exclusively for TeleVideo.

These interface more efficiently with the powerful 8088 and yield numerous benefits.

For example, our tiny custom chips do the work of many of the larger, more expensive circuit boards in an IBM PC. So we can offer a computer system that comes in one attractive, integrated case, is ready to run and occupies less desk space. A computer that edges out IBM's added-cost component system for reliability, ease of service and purchase simplicity.

Fewer circuit boards to cool also allowed us to eliminate the noisy, irritating fan IBM and most other PCs force you to put up with. And TeleVideo compatibles accept



THE BEST PORTABLE FOR THE BEST PRICE.

Features	TPC II	COMPAQ
High Capacity Storage	YES	NO
2nd Disk Drive	YES	OPTIONAL
Quiet Operation (No Fan)	YES	NO
Ergonomic Display	YES	NO
Communication Port	YES	OPTIONAL
International Power Supply	YES	NO
MS™-DOS 2.11	YES	NO
Graphics Display	YES	YES
Typical System Price	\$2995	\$3710

any IBM hardware options without modification.

THE BEST LINE.

But the Tele-PC is only one element of the TeleVideo IBM PC Compatible line.

The TeleVideo XT is the best hardware for users of popular IBM XT software who would appreciate an extra 10 megabytes of storage capacity along with the advantages listed on the preceding chart.

As the chart above demonstrates, our portable IBM compatible computer, the TPC II, is far and away better hardware than COMPAQ™. Better hardware—standard—at a better price.

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The TeleVideo IBM PC Compatible line is made by the world leader in multi-user computer systems and the number one independent manufacturer of terminals.

Our compatibles are available at participating ComputerLand and Entré (call 800-HI-ENTRE) dealers or you may call 800-538-8725 for the dealer nearest you. In California, call 408-745-7760.

Before you invest, make a few simple comparisons. You'll find that TeleVideo—not IBM or COMPAQ—has the best hardware for the best software. At the best price.

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TeleVideo®
Personal Computers
TeleVideo Systems, Inc.

CIRCLE 128



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wants to join in. Although conferences usually start on a certain date, they will stay in the data bank until erased. In this way, someone can walk in on a "meeting" days or even weeks "late," and be updated immediately by reading the previous notes.

The idea to have a "computer-show conference" began last November when Steve Deering, a friend of Greenly's and the western regional sales manager for Parti, started a Parti conference covering the Comdex show in Las Vegas. Deering told people he was going, and that he would send back reports.

Soon after he arrived at Comdex, Deering was called back to California, and so Greenly stepped in, sending reports to the people who were suddenly deprived of their only source of information. Encouraged by the response and interest in the service he was providing, Greenly planned to be an "electronic interactive journalist" for the CES shows in St. Louis and Las Vegas.

Greenly is not a reporter by trade; he makes his living as a marketing consultant based in New York City. After 13 years with Avon Corp., most of it spent in sales and marketing, Greenly wanted to go it alone and was fascinated by the possibilities of the new technology, especially as it related to communications.

To implement his plan for coverage of the CES show in St. Louis, Greenly first entered an announcement into Parti called "CES-Getting Ready," in which he told readers of his new "interactive, electronic reporting" and invited them to ask questions and "jump in with their own perspective and contributions." By characterizing himself as a "non-techie," Greenly tried to extend participation to those who might normally shy away for fear of being drowned in a sea of technical jargon.

When he was ready to report he went into a pay phone, hooked it up to his acoustic coupler—which is at-

tached to his TRS-80 Model 100—and dialed some numbers. In this way, the text he had entered on his Model 100 computer from his coverage of the show was sent to all of his readers through the Model 100's built-in modem. They awaited his report, and fired off questions and comments to him through their modems and personal computers.

In order to make his reports fit the interests of his readers, Greenly took advantage of a balloting feature in Parti. He asked his readers to rate the companies having exhibits at a show on a scale of one to five, depending on their enthusiasm to hear about a company. The computer automatically tabulated the ballots and gave averages. This way he knew at a glance what the most interesting topics were for his readers, and could see changes as well, so he could plan his coverage accordingly.

At the airport in St. Louis on the way to CES in Las Vegas, Greenly issued a report from a phone booth. Greenly told his audience "IBM is not at this fair. They were at Comdex. More to say on that later." He also informed them that Macintosh will probably be announced at Apple's annual shareholders' meeting, and that he will be covering the meeting and the press conference following and will hold another conference for those events.

Inside the show, Greenly gave his first impressions of the conference, describing the crowd attending: "What's it like? Well compared to Comdex—there are noticeably more women, more foreigners (especially Japanese), a younger crowd, more people in blue jeans, more 'just folks.'"

One of his readers joined the conference from Tel Aviv, Israel, telling Greenly that he was "hanging on to every word." Greenly was most impressed, entering a note: "P.S., Shalom to David reading these reports in Tel Aviv! That's a fact that I find every bit as dazzling as CES."

Buoyed by the success of his conference on CES, Greenly next made a Parti announcement that he would be covering the Apple shareholders' meeting. Titrilling the conference, "Macintosh Now," Greenly promised readers: "You will get the news before television reports, before the papers, and right before your eyes, right here." Greenly pointed out to potential participants that attendance to the meeting and conference was limited, and that he would make reports right after leaving the auditorium.

Describing his journalistic style for this event as "stream of consciousness," Greenly's first report on the meeting included his personal reactions to the Macintosh demonstration, descriptions of the packaging on stage, secretarial-type notes of all the speeches made, and descriptions of the audiences' reactions. When he sent his reports, he would pick up any questions for him in the electronic mailbox. He could scan the questions and then go back to read one or more in greater depth.

To satisfy the needs of his more technically inclined readers, who wanted more advanced answers to their questions than Greenly could provide, Greenly was able to enter material from another public conference into his conference. He simply told Parti to enter a specific answer given during "The Macintosh Apple" conference into his "Macintosh Now" conference, in order to supply the technical information the readers wanted.

Greenly thinks others will follow his example of interactive electronic journalism, perhaps moving into other topics besides computer shows. But Greenly admits there are problems with this reporting process.

One problem is directly related to the interactive nature of these reports: Readers complained that the questions and answers were interrupting the flow of reports. So, for his next conference on the Softcon show

in New Orleans in February, Greenly decided to conduct two conferences. One was a "read only" conference which contained only his reports on the show—no questions allowed—and the other conference gave people the chance to ask questions and discuss points.

Another problem that arose is of a technical nature. For those instantaneous reports from airport and corner pay phones, Greenly must use an acoustic coupler. The coupler tends to pick up a lot of electronic noise and interference that causes text to be garbled, so when he can, Greenly uses a direct connection through a hotel room phone.

Then there is an even more practical problem: Greenly doesn't get paid for the computer show coverage he provides. When you consider the cost of plane fare and hotel rooms alone, that's a pretty large donation of both time and money. Greenly explains that he could charge a fee by making his conferences private and requiring a password, but he doesn't seem to think that would work out too well, nor does he think it would cover his expenses.

He does, however, hope that he will make himself and his marketing service more known through the people who join in on his conferences. This is possible through a feature on Parti called Profile. Using this feature, anyone who joins a conference can enter some material about themselves for others who are curious about them. So, in his profile, Greenly mentions his consulting service.

Besides the financial rewards he is sure will soon come his way as more people know and experience his service as a marketing consultant, Greenly has received the gratitude of readers as his personal reward. He gets thank you notes regularly, and has plans to continue offering his services even after the financial rewards start coming. Says Greenly, "I love doing it, and I hope my consulting business will help pay for it."

Portable Computers Versus The Airlines

If all frequent travelers could have one wish, most of them would probably wish they could take all the countless hours they've wasted sitting on airplanes and tack them on to the end of their lifespans. The time spent aboard an airplane can be about as stimulating and productive as time spent recuperating from the flu. But now that the portable computer has entered the marketplace, the globe-trotter can easily pass those airborne hours making sure that the business presentation he has spent so much energy on is everything he wants it to be for that important meeting he has to rush to when he gets to his destination, right? Well, don't count on it.

Most major airlines have banned portable computers from the friendly

skies because of general speculation that the machines may interfere with an aircraft's navigational and communications equipment. But none of the airlines contacted could cite a specific instance where a portable computer prevented one of their airplanes from safely reaching its destination.

Air Canada says the portables are not allowed because they "could interfere with the navigation of the aircraft." When asked what the airline based its decision and that conclusion upon, the spokesperson answered "company decision." United Airlines has also banned the portables. When asked if this decision was based on any kind of test results, a spokesperson replied, "Apparently." Japan Airlines would not say that the portables were banned, just that they are "not among the allowable items to be used aboard the aircraft." The best Pan Am, which also operates National Airlines, could come up with is an "as long as their circuitry does not transmit by radio waves" condition.

Repeated attempts to get a simple yes or no from the airlines on whether passengers would be prohibited from using the portables in-flight have been futile. One spokesman goes so far as to suggest that using a portable computer in-flight could wreak such havoc with navigational systems as to repeat the fate of Korean Airlines Flight 007, which was shot down by the Soviet Union last September after drifting into Soviet airspace. The spokesman says that, of course, he's no electrical engineer, but "you don't want to take the chance."

But just what chance are the airlines taking? According to Sally McElwreath, director of public affairs for TWA, one of the few airlines to allow the portables to be used in-flight, "We haven't had any problems with them. They're self-contained, and the passenger is not communicating with another one in the cabin. There shouldn't be any problem."

"Sometimes there is just no point



Photograph by Marty Katz

Rod Jago of the Radio Technical Commission for Aeronautics is studying the issue of computers on airplanes.

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in testing," she continues. "If the FAA (Federal Aviation Administration) says, 'There's some problem with this, it is going to cause some communications problem and it is up to you whether you want to do it or not,' then the airlines say, 'OK, now we'll test it to see if it interferes with our communications.' But the FAA hasn't had a problem with it. We don't see the need for any more restrictions."

Joanne Sloane of the FAA says that the FAA has not advised any airline to ban the portables and that, "At this point, there aren't any problems the FAA knows of."

Eastern Airlines agrees that there aren't any problems with portable computer use in-flight. In a recent policy statement, a spokesperson at Eastern said the airline is allowing computers to be used in-flight "as a result of tests Eastern conducted that showed no interference with navigational or communications equipment." Because of the tests, conducted over a two-month period, all personal and portable computers, electronic games, and solid state calculators are allowed in-flight. Some electronic devices, such as walkie-talkies and radio-controlled toys, are still banned. But the ruling allowing computers to be used applies regardless of make or model.

Along with TWA and Eastern, British Airways and Air France permit the portables to be used in-flight, although British Airways says it's currently "rethinking" that policy. Aer Lingus has banned the portables pending the results of its own internal testing. A source at American Airlines didn't know what the company's policy was, but saw no objection to using the portables because they are self-contained units. "They are not expected to transmit anything outside the aircraft to try and get additional data from some other source," he said, adding that "just normal logic tells you" there isn't any problem. But then official word came

from American's Vincent Medugno, who said the airline had banned the portables pending test results from the Air Transport Association (ATA).

The ATA testing turned out to be a study conducted by the Radio Technical Commission for Aeronautics, a non-profit group that has been commissioned by the ATA and FAA to look into the problem. "I know there has been some publicity that we're going to do some testing, says the RTCA's Rod Jago. "There isn't going to be any testing."

The RTCA committee is merely going to review Federal Aviation Regulation 91.19, which deals with the use of portable electronic devices in-flight, and make appropriate recommendations. The regulation names the devices permitted on-board: tape recorders, pacemakers, hearing aids, electric shavers, and "any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used." This is the portion of the regulation that the airlines employ to back up their actions in banning the portables.

The only RTCA committee paper which contains any evidence of in-flight interference so far is a letter from Eastern Airlines chief engineer D.W. Crosby reporting an incident "whereby an engine was shut down due to intermittent light indications that later were attributed to passenger operation of a portable handheld Pac Man game." Portable computers are not mentioned by name in the letter except for the following excerpt: "As time passes, more and more of these devices have found their way into our aircraft. Articles have found their way into technical magazines and local newspapers with titles such as: 'But Will It Fly,' or 'Should Portable Computers Fly?' It is evident to us that the manufacturers of these devices are forcing

the issue, but trying to determine which one will or will not cause interference with navigation or communication systems is an endless and frustrating exercise."

Crosby calls for the RTCA to generate a Minimum Operational Performance Standard document for manufacturers to use as a standard for testing their products for airborne use, and these products would be labeled, "as meeting this standard in a manner similar to the Underwriters Laboratory sign of approval." This would be a boon to the airlines, who seem reluctant to play the bad guys to the white hats of the new technology.

According to Jago, "We don't really know the extent of the problem." When asked if he had any information that directly related portable computers to any specific instance of trouble, Jago said, "Nothing. Nothing whatsoever. There are just some indications that there may be problems affecting some of the systems on the aircraft. But there are no specific problems that have been related to us."

—Susan Jelcich

Software Saves Money On Wall Street

At the offices of the Securities Industry Association, a Wall Street trade group in New York City, a \$495 personal computer program is saving the firm about \$10,000 per year on one project alone. In addition, using a personal computer instead of a mainframe is saving the company \$10,000 a year in maintenance costs.

At 5 o'clock, when everyone is getting ready to leave the office, H. Pim Goodbody, Jr., vice-president for management services at the Association, makes sure the company's mailing labels have started printing.

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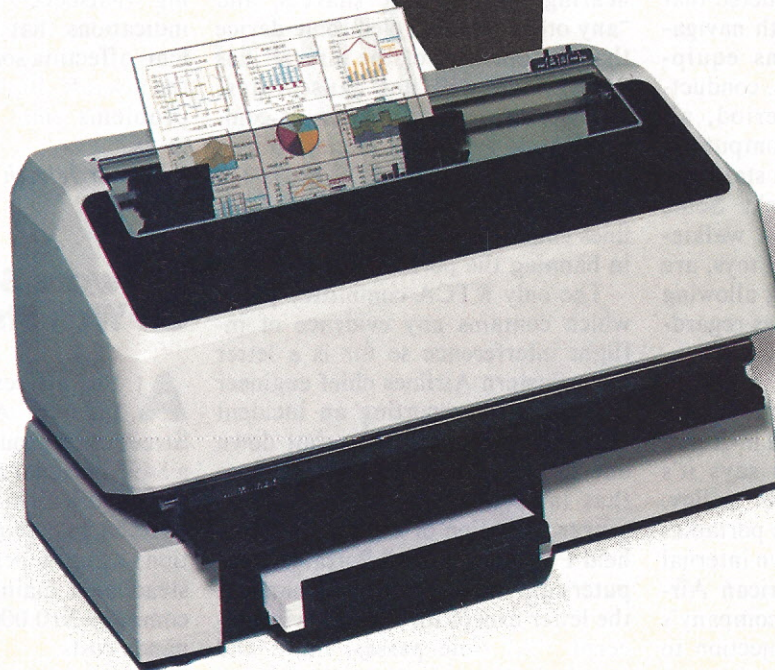
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before leaving the office a staff member sets a \$20 household timer that will turn the Apple III computer off at 10 p.m. Then, without the need for an operator to stand by, labels print automatically through the use of VersaForm, a data base management program from Applied Software Technology (Los Gatos, California).

At 7:30 the next morning, the timer kicks on and boots VersaForm, and the staff goes to work updating and editing new records on the computer. By mid-morning, the Apple III is free for use by the accounting department.

The Securities Industry Association serves 525 brokerage houses, and mails thousands of newsletters, announcements, and publications every week to different portions of its mailing list.

Originally, the Association and its 57 employees used a mainframe for their mailing label and accounting functions. Then they moved out the mainframe and moved in a pair of Apple IIIs, and found the Apple IIIs to be "essentially what we needed to replace the activities we had going on the mainframe," according to Goodbody. Impressed with the power and capabilities of personal computing, the Association has added five Apple II Pluses.

Of course, the right software package helped make the replacement of the mainframe possible, and VersaForm suited the Association's mailing list needs. "There weren't that many data base management systems a year ago that could handle our mailing list needs," says Goodbody. "We needed a program that could hold 5000 records, give us efficient code selection capacity, and generate labels quickly. We got more than we expected."

The Association uses a Profile hard disk with the Apple III in printing the mailing labels.

"We installed a simple, efficient system that includes VersaForm on the Apple III. At the least, we elimi-

nated our mainframe and its \$10,000-per-year maintenance contract," says Goodbody.

"In addition to the money saved, we have increased the productivity of our office," Goodbody continues. "VersaForm meets my definition of user friendly. The program can be used by someone who knows nothing about computers, or by a sophisticated user who can be more creative. In our case, I set up the program because I know the tasks it can link in our office. From a management standpoint, the employee has to be able to turn on the computer and get screen instructions. We can't afford to let everyone take time to learn how the program works; people need to know what it can do."

Employees frequently prove Goodbody's point. They come to him with questions about a word-processing program they use, but rarely about VersaForm. In less than 15 minutes, a new employee learned—without personal instruction—how to call up VersaForm records, enter information, and edit. The employee came to Goodbody to find out how to print the reports she needed, but she had learned everything else from the program's screen instructions.

VersaForm is used for other applications besides the printing of mailing labels, and it's credited with saving the Association \$10,000 a year on the registration process for the Association's Securities Industry Institute's annual conference. The conference is a tutorial for members of the Association, and the Institute is the training wing.


Melanie Gaul, who supervises the registration system, put her expertise to work in developing data base categories for the registration data. By setting up a VersaForm file, Goodbody says, the Association saves the \$10,000 per year on the costs of having the registration forms and data typed up every year.

Goodbody confesses he is a personal computer nut. "I can get in and

wallow in arcane questions like, 'Why doesn't it work?' when the average employee doesn't have the interest," he says. "I think it's wonderful that most people in our office don't read the manual. Why put others through the learning process when they can do their jobs just as well without learning more than they need to know? After all, I read the manual every three to four months and always find new applications and functions."

The last time he read the manual, Goodbody installed the Association's insurance pool. The enabling feature was VersaForm's column items which allow multiple transactions to be posted on a form. VersaForm includes a business forms processing capability that will fill in, from data stored in the computer, any form the user already works with or would like to create. The Association regularly files a report with the insurance carrier showing all insured firms, their payments, and several percentage breakdowns of each payment. Even after the change over from the mainframe, the staff manually prepared the report. But Goodbody duplicated the columnar report form for use on the Apple, and figured the formulas for the calculated fields.

"The staff came to me and asked if we could get the insurance data and carrier's report onto the microcomputer," Goodbody says. "It took me 15 minutes to create the VersaForm data base design. I gave it to the staff, and while I sat there, they used it to redo their day's work as a test. It checked out and even corrected some small errors. (It took only) an hour and a half of my time, and their job is vastly improved."

Goodbody relies on VersaForm's printing speed and versatility, as well. "The report generator created a work file which eliminates the read-write-wait problem of some data base management systems. That speed, coupled with our overnight printing capability, saves us hours of time weekly." 

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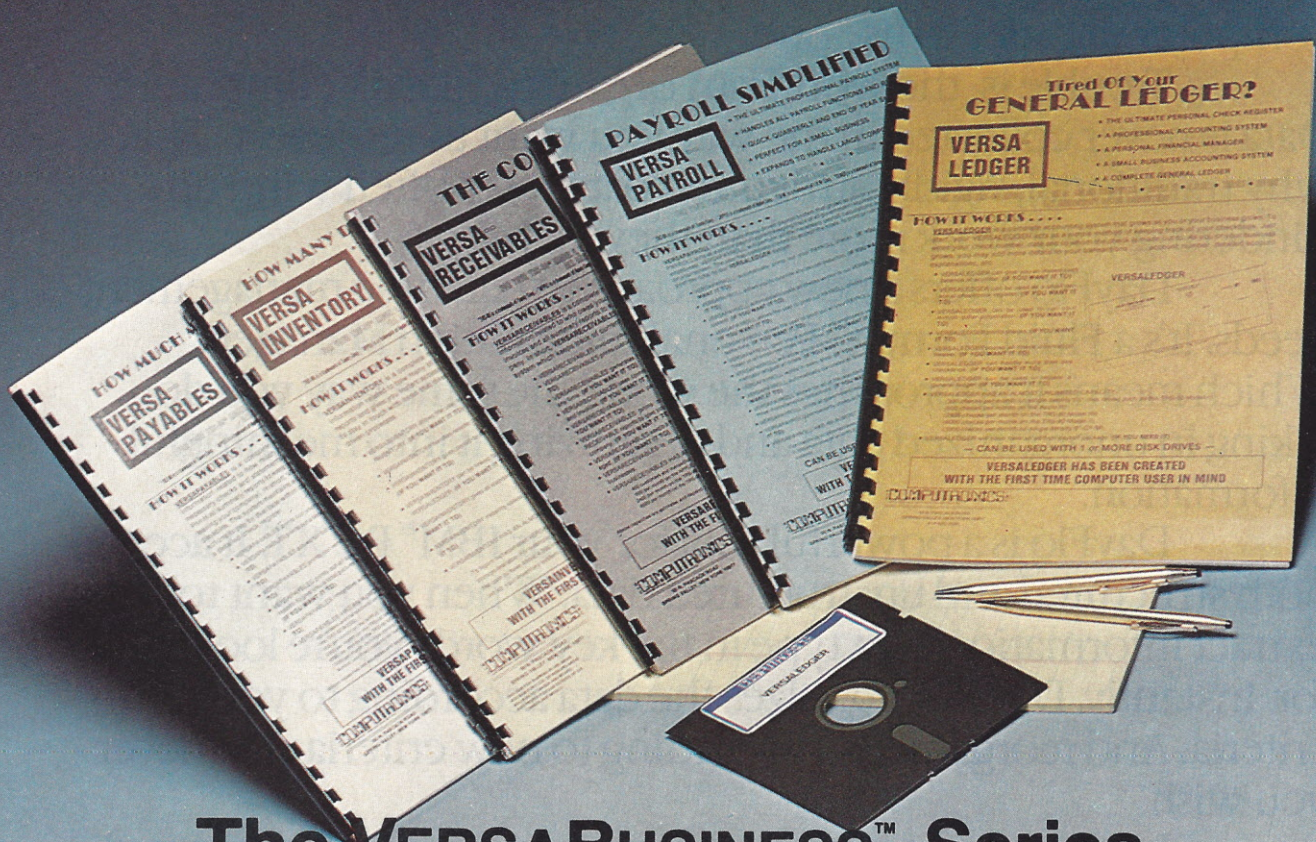
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Why The Big Corporate Battle Over Personal Computers?

The push to bring personal computers into corporations is adding new heat to the old battle between DP departments and computer users

by Kevin Strehlo, Senior Editor

If you're a manager in a Fortune 1000 company who's about to buy a personal computer either for yourself or for your staff, be forewarned that it's not as simple as it used to be. There was a time when an enthusiastic manager could just go down to a computer store, buy a personal computer, and slip it into his budget under office expenses. But personal computers have since become subjects of corporate policy-making, and the process of making the purchase has become a lot more complex. At companies where the data-processing manager has enough clout to influence personal computing policy, you may be surprised not only at the number of questions you'll have to answer, but at how little control you have. And if that data-processing manager harbors a bias against personal computers, you may have a battle on your hands.

We think the subject of who *really* buys personal computers in large corporations—and how that can influence your ability to get the right hardware, software, and support—is important enough to be the focus of a three-part series. In this article, and the two to follow in June and July, we'll discuss at length the many issues relevant to that purchase process, including not only who buys, but who supports personal computers. We'll discuss how best to leverage the expertise of the data-processing de-

partment, and what you can expect from it. What should the people buying computers think about? Is it important to buy a machine that can be linked easily to a mainframe? Why are top-level executives getting personally involved in the purchase of personal computers?

These issues and others will be illuminated by examining what's actually happening in large corporations across the country. To begin, we look at a few data-processing departments and how they're bringing—or not bringing—personal computers into their corporations.

The struggle at RCA

According to several managers at the communications satellite division of RCA, it can be harder to get a personal computer there than it is to get a mainframe—unless you don't really want one, in which case it's easy. Their experience is worth delving into, because it sheds light on opposite poles in the world of problems a personal computer buyer can face.

On the one hand, people who want and need personal computers to get their jobs done are being put off by a very influential DP manager, while still others are having computers plopped on their desks—but because of a lack of encouragement or support from the DP department, those computers are going unused.

Ken Johnson is one of many managers in the engineering department at RCA who wanted a personal computer—an Apple III, to be exact—not because he thought it might be nice to have one, but because he'd had a lot of experience using the machine, and he knew it could do the job he needed to get done. He knew it could do NASA-style project management, and that it could run some custom programs that calculated moments of inertia to determine whether the arrangement of electronic components inside a satellite might upset its stability in space. "Once we arrived at a stable arrangement of the components, we could document it using the graphics capability of the Apple, and pass that sketch along as a guide to draftsmen doing the really detailed drawings on expensive computer-aided design equipment," he says. Johnson also needed the Apple for general management tasks: forecasting using VisiCalc, word processing, and presentation charts.

Johnson knew that even though the setup he wanted would cost less than \$5000, it was not going to be easy to win approval. At RCA, such a personal computer purchase was classified as a capital expenditure, so the decision went to the upper levels of corporate management. Because these people weren't computer experts, they went to the corporate

computer center for advice. Approval of the department's first request for Apples had taken an entire year, and that approval came only after a great deal of time was spent vigorously justifying the purchase.

Johnson blames the problem on the mentality of the DP manager, who thinks in terms of terminals connected to a mainframe, and passed his bias against personal computers on to the capital expenditure committee. "If it were entirely up to the DP manager," says Johnson, "there would probably be no personal computers in use here."

After Johnson put in his request for the Apple III, he asked for a multimillion dollar upgrade of the department's CAD system to three mainframes and 32 workstations. The CAD system has already been approved, while the Apple is still in limbo.

"They spend time arguing over whether personal computers are cost effective," he says. "Meanwhile, I'm a middle-level manager who just doesn't have enough time in the day to get my whole job done without a personal computer. It's a real pain when someone takes it upon themselves to say 'no,' I can't have this necessary tool."

Dusty XTs

Adding to the sense of frustration over personal computing policies at RCA were a number of IBM XTs that were gathering dust on the desks of busy executives. David Gross, a manager of mechanical analysis, bemoans the fact that "it was easier for me to win approval for a VAX 11/780 minicomputer than for an Apple, while guys who didn't even want computers got XTs without lifting a finger."

The purchase of XTs for the executive suite was approved, says Gross, because a general manager—who happened to be the data-processing manager's superior—said, "Hey, we need some personal computers to im-

prove our productivity." The data-processing manager had no choice but to push the idea through the capital expenditures committee, says Gross, and so it won quick approval. Because the data-processing manager's support did not go quite far enough, however—he offered no training or support to the employees—the computers accomplished nothing. Without the proper training, the employees got as far as turning on the machines and looking

"It was easier for me to win approval for a VAX 11/780 minicomputer than for an Apple, while guys who didn't even want computers got XTs without lifting a finger."

David Gross
RCA

at the MS-DOS prompt.

These busy upper-level managers were not technically inclined or self-motivated enough to learn how to run the computers and Lotus 1-2-3 on their own, yet no provision was made to provide training or support, or even to try to motivate them by explaining the potential benefits of personal computing. It was only when Ken Johnson took it upon himself to help that things got rolling. "I got Lotus 1-2-3 loaded onto their hard disks so it would come up automatically when they turned their machines on, showed them a few basic keystrokes, and got them going on the Lotus disk

tutorials," he says.

Of course, not every data-processing manager is going to do his best to keep personal computers from coming into the company, or sabotage them once they arrive by failing to provide the support—be it advice, assistance in setting up, configuring, or using the hardware or software, or help with repairs—that computer neophytes need. As a matter of fact, DP has many reasons to be helpful, one of the more obvious ones being that it's a way to regain some of the control over a company's computing resources that they lost when purchasing of personal computers was "taken away" from them by independent departments. Perhaps the best way for DP to regain partial control is to offer its expertise to help support personal computer hardware and software.

But trying to support personal computers when you have no voice in the purchase of those computers and software can be aggravating and confusing. "If your job is simply to support whatever is out there," explains Marty Butler, administrator of the Micro Managers Association in Los Angeles—a group of people responsible for some aspect of personal computers within a large corporation—"and you find people are using seven different spreadsheets, you're faced with an agonizing situation. If almost everybody is using VisiCalc and Lotus 1-2-3, and only one guy is using Context MBA, you may have to tell the Context MBA guy, 'Sorry, you're on your own.'"

To alleviate such frustrating situations, most of the data-processing departments that are put in a position of support are forced to rely on their own judgment about what the best hardware and software is, and draw the line there. The result is usually a list of supported machines and a list of supported software. Sometimes there is a secondary list as well, particularly of software that the DP department has heard good things

about, but hasn't had any direct experience with. The information services group at the Atlantic Richfield Corporation in Los Angeles is one example of how this is working. Senior technical consultant Don Smith explains: "For example," says Smith, "Lotus 1-2-3, MS-DOS, and PFS:FILE are on the supported list, and CP/M-86 and Microsoft Word are on the approved."

The rule at Atlantic Richfield since DP has assumed this support role is that all requests for personal computing purchases, in the form of a description of the desired use of the computer in generic terms and a specification of the support the user desires, must come through both a corporate group in charge of planning and technology and the information services group, after being approved by the head of the department of the person making the request.

"We try to fill their needs with software from our approved or supported list," says Smith. If nothing suitable is found there, the search goes on. "We have built a list of people who are experts in various fields—people in other companies, consultants, and so on—and we buy all the books that list software sources, and clip reviews and descriptions from magazines," he explains. The search is somewhat restricted, however, because Atlantic Richfield's corporate group automatically defaults to an IBM Personal Computer or XT, and will only approve other hardware, on an experimental basis, if software that runs on the Personal Computer isn't available. Once appropriate software is decided upon, the personal computer purchase is approved and sent to the purchasing department, which then looks for the lowest possible price.

Many corporate entities are taking the same tack as Atlantic Richfield, and are putting DP in charge of personal computing purchases. Some have even set up their data-pro-

cessing department as a kind of "computer dealer," with the charter of selling personal computers to other, independent sections of the company, and then providing support. The Traveler's Insurance Company in Hartford, Conn., for example, has set up a company "computer store" with a showroom. It works like this: Usually, the buyers need budget approval from their departments before they "shop." Once a selection is made, from whatever

times decided to buy computers from someone else. The result is that Connecticut Mutual's DP people really listen to what the user is saying, and try to keep them happy. This is an unusual and favorable way of doing things, but it wasn't always so rosy for the Connecticut Mutual end user.

Connecticut Mutual had once dreamed the standard data-processing dream of expanding its network of IBM mainframes—to which everyone throughout the company



"The users were about to show us where computing was going again, only this time it was going to be personal computers instead of minicomputers."

Ted Stein
Connecticut Mutual
Life Insurance

Photograph by Michael Mella

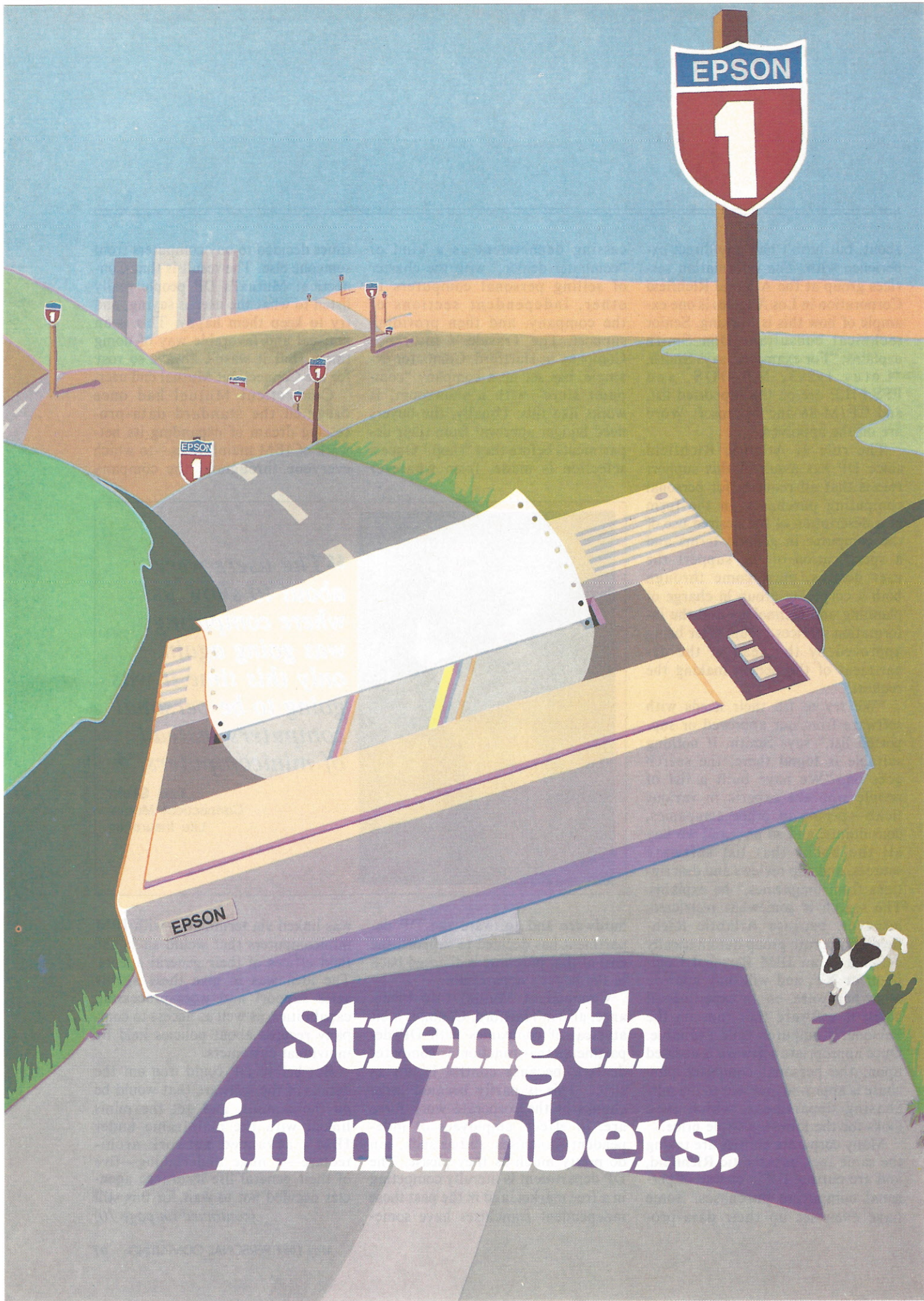
hardware and software the DP department has decided to support, the cost of that purchase is charged back to the buyer's department.

Connecticut Mutual Life Insurance, also in Hartford, Conn., is a bit atypical of companies with DP departments that function as computer dealers, because control is not as strict. This is partly because large chunks of the corporate work force are, in effect, employees of independent franchises, and as such, can do pretty much as they please. The DP department is literally competing in a free market, and in the past these independent franchises have some-

was linked via terminals—with IBM minicomputers that would sit in the field offices of their general agents. The idea was to give these agents sales support and word-processing capabilities, as well as access to company records about policies held by individual customers.

But before DP could iron out the details of the software that would be on those minis, and get the minis linked with the mainframe under IBM's advanced network architecture—a huge undertaking—five of their general life insurance agencies decided not to wait for this still

(continued on page 70)



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(continued from page 67)

far-off dream to become a reality and, in 1977, bought Wang minicomputer systems from someone else. When these five agencies rose to the top of the list in sales, Connecticut Mutual got on the bandwagon and decided to offer its own Wang minicomputer package to its other 85 general agents—before they too went out and bought from someone else.

By 1981, it was becoming apparent that grassroots computing was about to penetrate even deeper into the field force. TRS-80s, Apple IIs, and even Alpha Micros were spreading, not only in the offices of general agents but also throughout the field force of individual agents and brokers. "We figured we might as well bag the idea of a midrange minicomputer host," explains Ted Stein, an assistant vice-president for Connecticut Mutual, "because it seemed the users were about to show us where computing was going again, only this time it was going to be 2500 personal computers instead of 80 minicomputers."

The IBM Personal Computer had just been announced, and after deciding that Apple IIs and other 8-bit machines didn't have the processing power necessary to handle the data speeds and conversions they needed for their network of personal computers, the insurance giant's data-processing department bought 1000 of the new 16-bit machines with the intention of adding a complement of standard software and reselling them to their field offices. But first they decided to make the package as attractive as possible.

Since many of the offices were already using Wang word processors, the department commissioned a software house to write a new word-processing package for the IBM Personal Computer—later marketed as the best-selling MultiMate—which would do everything the Wang word processor did, including customizing form letters by merging in a client file and document assembly

from prewritten paragraphs.

Also included in the package was the terminal emulation software necessary to let the Personal Computers access corporate records on the mainframe, as well as VisiCalc and a program that produced graphics for sales presentations. Although this software complement didn't fill all the personal computing needs of the field force, DP felt it was best to let the field force fill their other needs individually from the

"Instead of letting professionals tinker with dBASE II, you leverage the resources of the DP group and provide a package that delivers increased productivity immediately."

Don Betts
Wells Fargo Bank

large amount of third-party software the IBM Personal Computer seemed sure to attract.

Besides outlining the software package, the kit detailed an impressive plan for maintenance of the system: If a system failed, the home office would ship a replacement system air express so it would arrive the next day. And there was a statement of support from the company president, saying he was behind DP all the way in their effort to put together the best personal computing package possible to help the salespeople get their jobs done.

Connecticut Mutual had put to-

gether a winner, and soon discovered what it meant to be a successful computing store. Career data-processing people who had been writing sales support software for minicomputers were turned into personal computer programmers, while others became experts on VisiCalc and MultiMate and, once it was available, Lotus 1-2-3. They established four WATS hot lines, and soon found themselves talking to their field agents about everything from why they should buy the official Connecticut Mutual Personal Computer, to giving keystroke-by-keystroke tutorials on the supported software packages and, if they knew enough, help on unsupported software as well.

But as we said, this seems to be a rare bright spot in the generally dim situation that exists between DP departments and managers who see a need for personal computers in their own departments.

Against personal computing

Don Betts has been working on implementing an integrated office support system at Wells Fargo Bank in San Francisco for several years. "We're talking true integration, true sharing of information," he says. Proposals had been drawn up by five different consulting groups, and after several false starts, and delays due to budgetary constraints, the project, as outlined by the Arthur B. Little company in San Francisco, was kicked off in May 1983. No vendor has been selected yet for the workstations and terminals that will appear on almost every desk. But one thing that's clear, says Betts, is that these workstations won't be personal computers in the usual sense, even for those professionals who might be able to benefit from isolated use of such commercial, off-the-shelf software as spreadsheets.

"The point is that commercial software is usually only a partial solution," Betts claims. "Why should a professional who makes \$45,000 a

year spend time developing a Lotus 1-2-3 model that's been solved 25 times at 25 other sites?" he asks. Betts's real concern, however, is what he refers to as "PC disease." "Suddenly you have this highly paid professional tinkering with spreadsheet models, learning how to run applications, and focusing his attention on a personal computer—he becomes something of a personal computer guru." Betts says there are over 700 professionals within the Commercial Banking Group of Wells Fargo, and the company simply can't afford the loss of time while people learn how to use personal computers and commercial software packages.

"My personal preference is that we develop our own programs that are very specific to the tasks people do, and designed so even the casual user can understand them," he explains. That way, he says, you don't lose productivity while a new hire learns a complex commercial package. "Instead of letting professionals tinker with dBASE II, you leverage the resources of the systems development group, and provide a package that delivers increased productivity immediately," he says.

In a very few cases, Betts thinks personal computers in a stand-alone mode, with commercial software, are the way to go. "We have personal computers in the administrative office, where financial analysts are anything but casual users of their spreadsheet programs. They are modeling something different almost every time, and for them, having a really flexible tool is necessary and perfectly appropriate."

But the real place for a personal computer in Betts's scheme of things is as a workstation linked to the mainframe, using the personal computer's local processing power to simplify the user interface with the bank's bread and butter data processing on mainframes. One application, already implemented, provides the bank's client-relationship managers with

cash-flow analysis and financial statements that are only possible by pulling specific data off the mainframe and manipulating it. "A dumb terminal wouldn't cut it; we couldn't do it without the personal computer. And it's extraordinarily efficient because the application provides exactly what they need."

For those who do get a personal computer from Betts's group for stand-alone use, there's no need to worry about catching the dreaded

paybacks, he points out how much more leverage Wells Fargo can get from these personal computers by writing custom applications and tying them into the corporate data base.

Betts may be on the right track—at least for his own specific application. But there is still the problem of where the resources to do this custom programming are to come from. The average backlog for getting new applications running in the average



"Why should a professional spend time developing Lotus 1-2-3 models? My preference is that we (DP) develop our own specific programs for the tasks people do."

Don Betts
Wells Fargo Bank

Photograph by Ed Kashi/Gamma Liaison

"PC disease." There are shells around DOS that make it very easy for the user to run the provided applications, without the need to become a computer guru—and very difficult to get to DOS to do anything else.

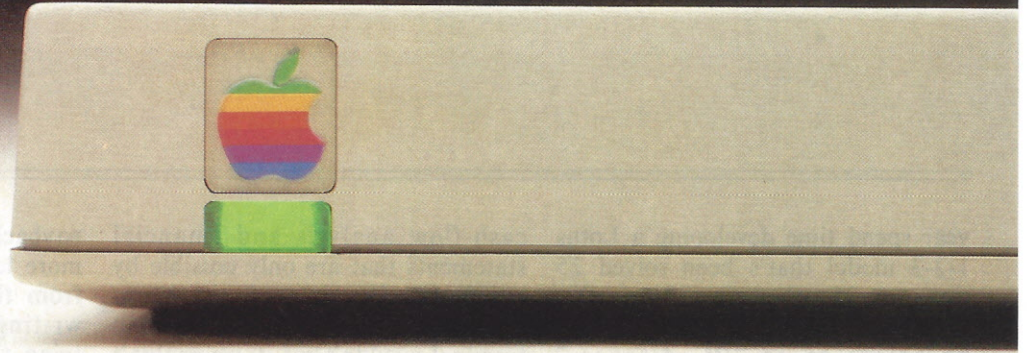
It's obvious that Don Betts is among the data-processing professionals who discount the personal computer's ability to improve the productivity of managers and professionals in large corporations, with the possible exception of hard-core financial analysts. When told of studies that show that use of personal computers with off-the-shelf application software results in productivity

DP/MIS department is 18 months to two years, according to recent research done by SRI in Menlo Park, California.

While Betts votes against widespread use of personal computers on the grounds that they can't meet his specific needs, other DP professionals cite increased demands and cost efficiency as reasons to resist personal computing.

According to a recent special report in *Computerworld*, data-processing professionals fear that "micro users will begin pressuring DP for more and better applications using centralized and local data bases, de-

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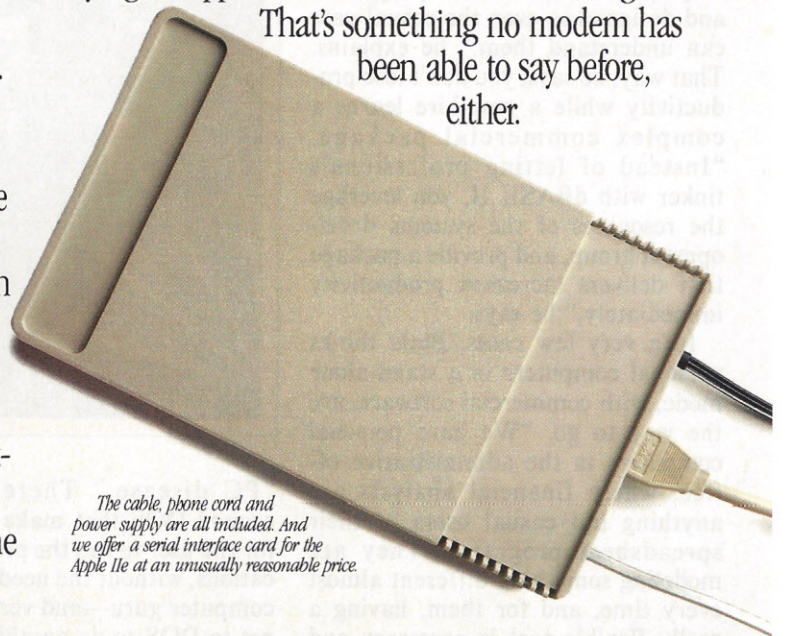
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signed with the same type of human interfaces that are currently available in some of the good micro software packages. In addition, users will demand that new applications be developed more quickly and at a lower cost than DP has been able to deliver in the past."

When it comes to the cost of such custom links to the mainframe, a study done by the Yankee Group determined that the cost of hooking up a personal computer to a mainframe can be seven times the original purchase price of the personal computer, once the costs of communication controllers, dedicated lease lines, coaxial cable, and application software are added up.

But is it imperative to link personal computers with the mainframe? The expense of such an undertaking would seem to add all the more impetus to the move toward stand-alone applications of personal computers. A recent government pilot project found that the personal computers acquired by government employees for stand-alone applications were paying for themselves in about a year. Indeed, Jack Stone, a columnist for *Computerworld*, notes that there is "a farsighted segment of the data-processing community that recognizes that the personal computer in stand-alone mode offers cost-effective solutions to a vast number of 'smaller' information-handling problems that are far too costly to implement on terminal-oriented minis and mainframes."

Thus, when data-processing people in charge of the purchase of personal computers assert that it's essential to buy computers that are able to share data and interconnect at the department level to begin with, and, ultimately, with corporate-wide data and applications resident on mainframes, it pays to weigh their advice against the benefits of stand-alone use of personal computers.

Remember, too, that this compatibility imperative goes against the

proven methodology for choosing a personal computer, which is to decide first what it is you want to do with the machine, then choose the software that best implements that chosen task, and finally choose the hardware that best runs the software you have chosen. When considerations of compatibility with the corporate data-processing environment are given top billing—as they are when data processing insists on buying computers that will easily link to the corporate data base—that proven method of getting the most out of a personal computer is tossed over in favor of corporate compatibility. But there are many DP professionals who don't see it that way.


More to come

What has emerged from this brief look at the influence of data processing in the purchase of personal computers in large corporations, then? The most common form of data-processing involvement in the purchase of personal computers is in an advisory, supporting role. When the commitment to personal computing is real, the result is to create a resource for the personal computing users in the company, within the limits of the data-processing department's ability to support the broad range of available hardware and software. Where the commitment is less than enthusiastic, it becomes difficult to obtain personal computers. Interestingly, where the commitment is very enthusiastic, but is directed towards a custom solution in which the personal computers are closely tied to mainframes, it is also difficult to obtain personal computers. In both cases, personal productivity is hindered.

In part two of our series on who buys personal computers in large corporations, we'll look at the benefits and potential pitfalls of other approaches to the purchase of personal computers. We'll look at Fairchild Semiconductor, where a committee

of executives passes on each personal computer purchase, and at other companies where upper-level management is guiding personal computer policy. We'll find out why department heads for firms such as Peat Marwick Mitchell and Co. are making large purchases of "non-standard" computers, in this case Apple's Macintosh, which goes against the corporate trend to standardize using one kind of personal computer.

At Bank of America, we'll look at the benefits of individual employees being able to walk into a Businessland outlet, have software demonstrated to them, and walk out with exactly what they need to get their job done. This gets us into the flip side of making a decision on what to buy, and where to buy it. At United Technologies, the purchasing department discovered that it could get a better deal buying 1000 Personal Computers from a local ComputerLand dealer than it could get from IBM itself. And we'll try to discover why, at another corporation, a purchasing agent went with a direct purchase from IBM, even though the number of computers being bought was too small to qualify for a discount. That purchase cost the company \$1000 more per computer than it would have cost to buy comparable computers from another large vendor.

Finally, in part three of our series, we'll look at things from the viewpoint of the departmental level. What factors should be considered when buying personal computers? Does the fact that purchasing goes for the lowest possible price actually cost the department money because of the hidden costs of configuration, training, and support? Finally, we'll deal with the ultimate question for the typical user of a personal computer in a large corporation: What can *you* do to make sure the company buys the best personal computer for getting your job done? 

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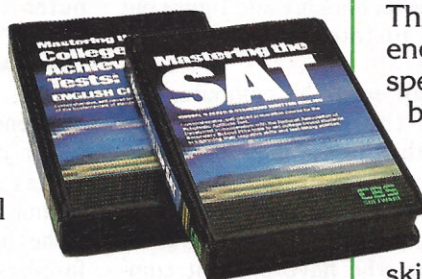
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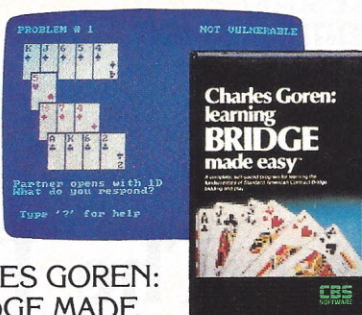
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The Pleasures And Perils Of Computing At Home

Integrating a computer into your family may be a tad harder than you think

by Craig Zarley, Contributing Editor

It's 1984, and George Orwell was half right: When he predicted that we'd submit to the new technology, he said we'd do it in silence—and although there are computers in millions of homes today, just how "silently" they arrived—and coexist with the family unit—is open for discussion. The truth is that regardless of how the personal computer found its way into our homes, we are finding more and more ways to use it. We do our banking at home with the personal computer; we write with it, track our personal finances, and play games on it. We have access to most of the libraries of the Western world through it. We conduct our business on our computers, and some of us have given up the daily commute, opting instead to remain at home to do our work.

The impact of the personal computer in these roles is obvious, and for the most part, positive. But there are other changes—changes that are just beginning to have impact on our families in ways we are just beginning to understand. We are the "guinea pig" generation. Five years ago, if someone—anyone—had told you that today, you would own a computer as powerful as the giant mainframes of not too many years ago, you would have felt a heady mix of fear and fascination. But the next generation, the one now growing up with computers, won't have that

problem. That generation will understand the technology and feel comfortable with it. But we're still feeling our way—we're the ones who have to deal with the lightning-quick leap into the Information Age. We have to sort out the technology and figure out how best to integrate it into our family life.

We've all seen the computer ads depicting the average American family bathed in the glow of a computer screen, contemplating the machine with a rapture usually reserved for newborn babes. But as those of us who have brought computers home have undoubtedly discovered, there can be quite a gap between what advertisers would have us believe and what actually happens when the computer moves in.

What most people are finding out is that this picture of family computing doesn't exist—at least not quite in the way that it's usually portrayed. Most people who bought a computer with the hope of sharing it with family members on an equal basis have experienced a rude awakening. The personal computer is not a shared commodity; it's a device used by individuals to perform specific tasks. What happens is that one person buys the computer for a specific purpose, then tries to involve the rest of the family in computing. But that's a bit of a no-win situation: If he succeeds, the computer becomes

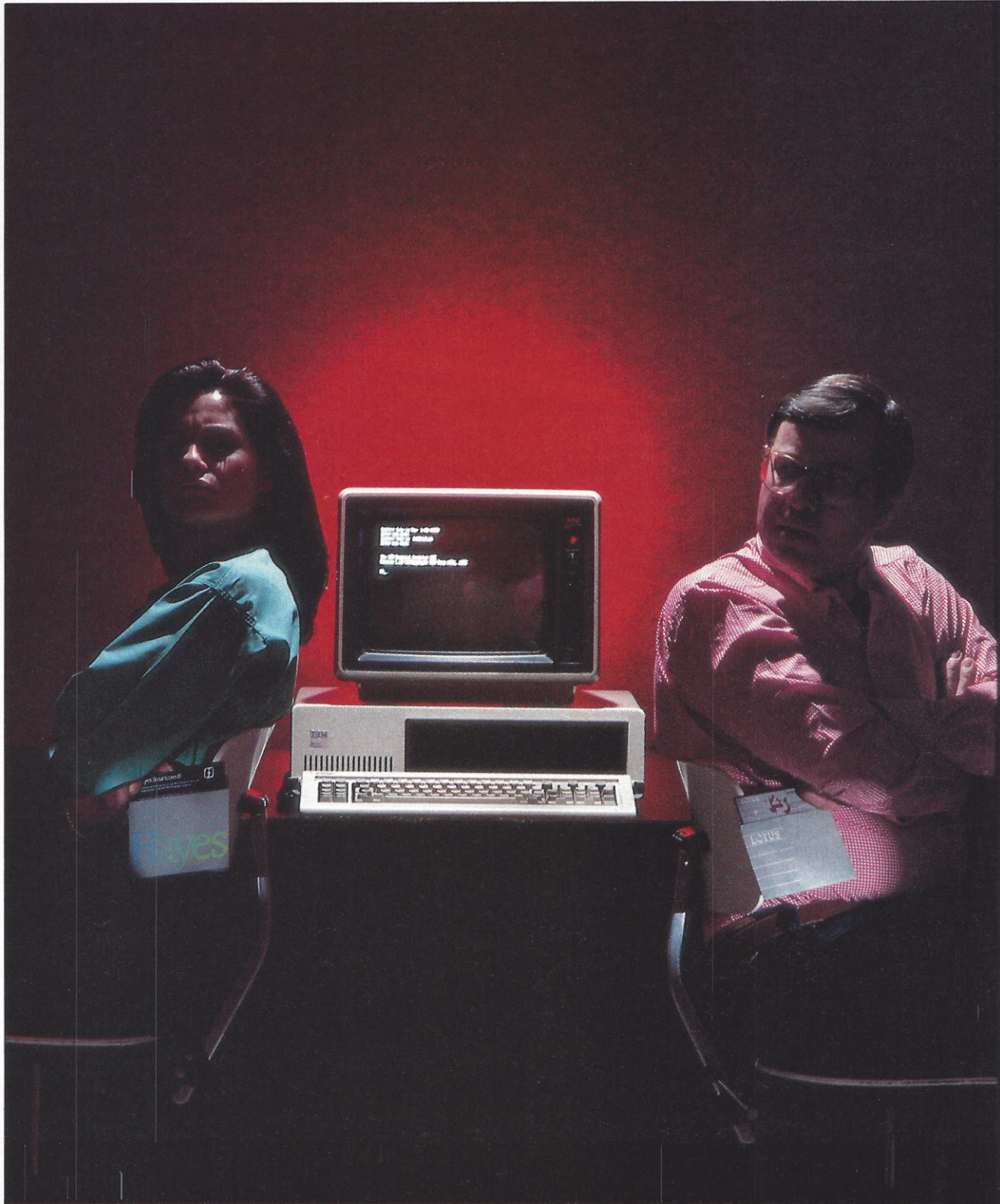
an object of competition as wife and kids bid for time at the machine; if he doesn't succeed, if he remains the sole user, the family may resent the time he spends with the computer.

And yet, the potential for the computer to pull families together is there. "People once feared the computer would create a dehumanizing effect, but the exact opposite has happened," says Jerry Willis, professor of educational psychology at Texas Tech University and the author of over 20 computer books. "The personal computer can bring families together the way no other machine can."

According to Willis, one of the ways the computer is having an impact on American families is by providing the user with a means of taking his work out of the office and bringing it home. In fact, this is the way most computers get into households. And in some cases, this can even mean working at home full-time. That's a situation loaded with implications—both positive and negative. What are the effects on the family?

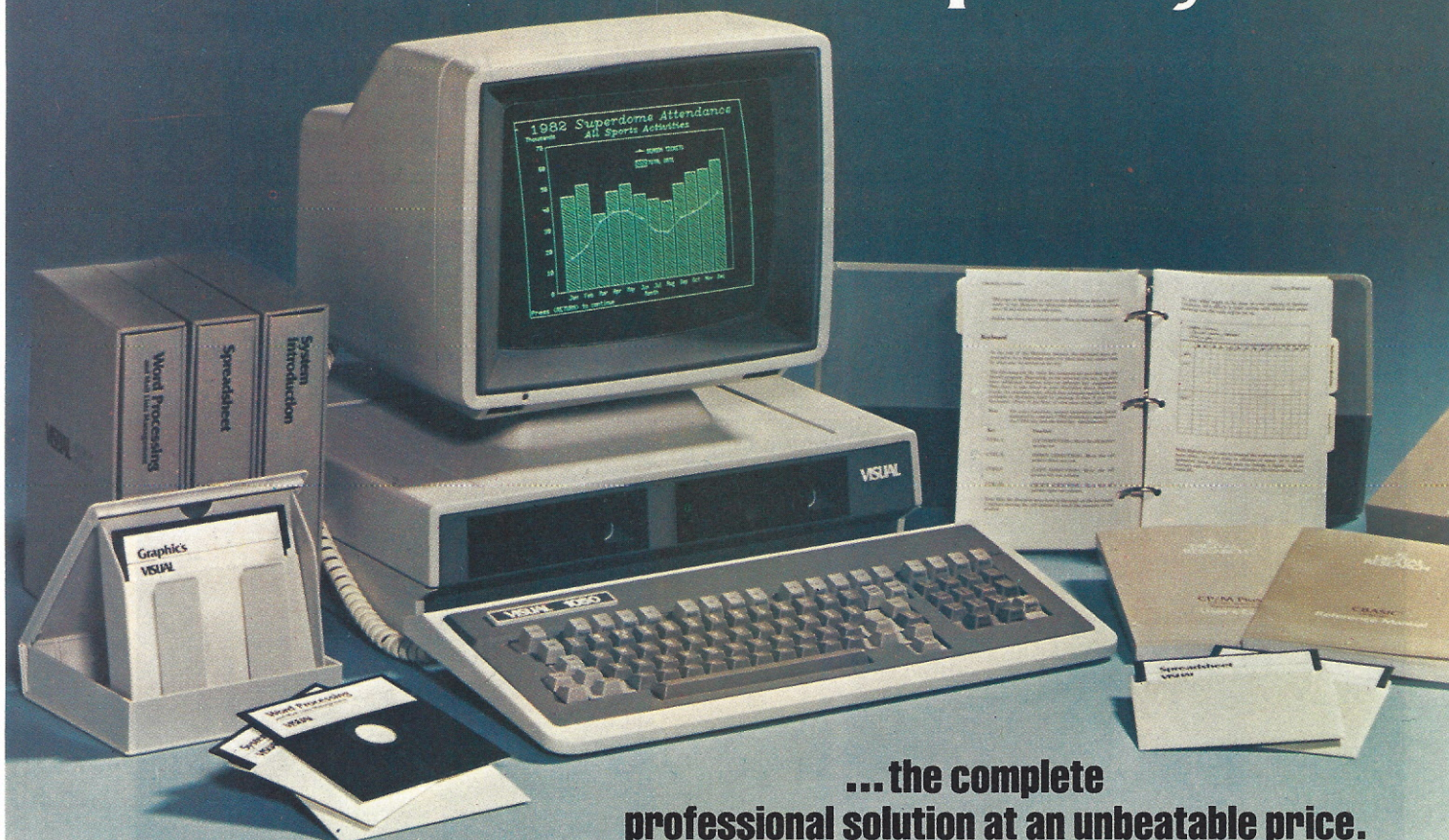
Harley Train is a software engineer and writer who lives near Manchester, N.H., but works for a Los Angeles software company. Train communicates with California each day using his Epson QX-10 computer and a Hayes Smartmodem 1200. Train is a self-confessed computer

*Are computers bringing
families together, or
tearing them apart?*



Photograph by Brown Studios

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Base System Price ¹	\$2,695	\$2,750	\$2,390	\$3,495
Serial Port (RS232)	STANDARD	\$119	\$195	2 STANDARD
Parallel Port	STANDARD	\$119	\$180	STANDARD
Bit-Mapped Graphics	STANDARD	\$240	STANDARD	\$845
Word Processing Software	STANDARD	\$200-\$500	\$200-\$500	\$200-\$500
Spreadsheet Software	STANDARD	\$200-\$300	\$200-\$300	\$200-\$300
Business Graphics Software	STANDARD	\$200-\$400	\$200-\$400	\$200-\$400
Communications Software	STANDARD	\$100-\$200	\$100-\$200	STANDARD
COMPLETE SOLUTION PRICE ..	\$2,695	\$3,928-\$4,628	\$3,465-\$4,165	\$4,940-\$5,540
Dual Drive Capacity	800 KB	640 KB	280 KB	800 KB
Graphics Resolution	640 x 300	640 x 200	280 x 192	800 x 240
Keys on Keyboard	93	83	63	105
Standard Memory	128K	64K	64K	64K
Optional Winchester	YES	YES	YES	YES
Tilt and Swivel Display	YES	NO	NO	NO

1—Includes CPU, Standard Memory, Keyboard, Display, Two Disc Drives, and Operating System.
Based on manufacturers' information available February, 1984. VISUAL 1050 includes 128K User Memory standard.

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CIRCLE 52

The personal computer is not a shared commodity; it's a device used by individuals to perform specific tasks.

**LEISURE/
ENTERTAINMENT**

addict. Before there was such a thing as a personal computer, he built several of his own and sold them commercially. In addition to his Epson, he owns an Apple II Plus, a TRS-80 Model I, and a Sinclair ZX 80. Until about six months ago, Train worked for a large printer manufacturer. He commuted 30 miles to the office and worked the traditional 9 to 5 day. "When I came home at night, I'd just collapse in front of the tube until it was time to go to sleep," he says. "Working at home on the computer showed me how many hours during the day I had wasted."

For Train, much of the stress associated with working in an office environment disappeared when he began working at home. He can now choose to work when he is most productive, rather than submitting to a regimented work schedule. The net result, he says, is that he actually works more hours than he did before, but without the resulting fatigue.

"Now all I have to do to get to work is take about 15 steps," he says. "I value this because I've never been able to spend so much time with my family."

The personal computer has allowed Train to work at home, a situation which for him holds nothing but benefits. But what kind of impact has this had on his wife? "It will take me a little while to get used to having him around all the time," says Train's wife Pat, who works part-time at home doing typing on an IBM Selectric. "At noon, when I'm taking a break, I watch the soap operas. And he'll come into the room and say, 'Oh, so you're watching those soap operas.' Well, when I have some free time, I like to watch them. Some women are dying to have their husbands at home, but you do lose a little of your privacy."

The adjustments to be made when one person works at home with the computer are doubled when both husband and wife work at home. Unless each partner owns a computer, com-

petition for computer time can become a central issue. Jerry Willis works at home, as does his wife Debbie, the education editor for dilithium Press. The computer has definitely changed their lives.

"My wife and I both fight over our Eagle PC because we both do work at home that requires a computer," says Willis. "Our solution is to buy another computer, and we're shopping around for one."

Actually, they already have two computers—the Eagle and a Hyperion portable. When they travel, the Hyperion usually goes along. At home, when they have a conflict over who'll use the Eagle, the loser in the dispute makes do with the portable. Or used to, until their most recent dispute.

"I had to write a book proposal which required using Lotus 1-2-3," says Debbie. "I couldn't get it to run on the Hyperion, so I got to use the Eagle and Jerry had to use the portable. Portables are great if you use them for a couple of hours in a hotel room, but they're not very good for extended use. The keyboard and the small screen on the portable convinced Jerry that we needed another Eagle."

The second Eagle PC should ease some of the strain in the Willis household, where even the experts fall into the traps of family computing. "I feel very personal about the Eagle," says Debbie. "It's mine. I know how it works, and it has become an extension of me. I want to use it, and I don't want to share it."

The same feeling extends to the portable. While the new Eagle will solve the access problem at home, what about when they both travel and both want the Hyperion? "I had to go to Dallas recently and Jerry was going to Oklahoma," says Debbie. "I needed the portable, but he put in his dibs on it first, and I had to go without."

Negotiations for computer time become even more complicated when

there are children involved. Ask yourself this: If you look on your computer as your personal domain, how will you react to a line of kids waiting to get at the machine, whether for homework, games, or computer literacy? Of course you want your kids to be involved—they may have even been your excuse for bringing a computer into the house. And yet, if you're hooked, it can be hard to give up time to an 8-year-old who's waiting to blast alien invaders.

Paul Carlson, president, Plan Design Consultants, Inc. of San Mateo, Calif., says he wants his wife and kids to use the computer more. But he uses it so much himself, they can hardly get a keystroke in edgewise.

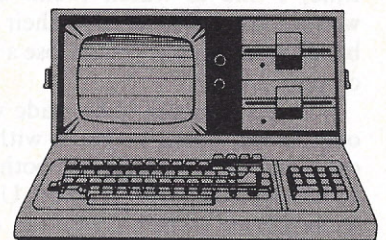
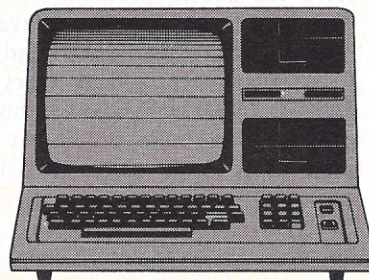
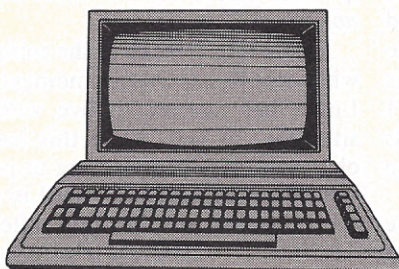
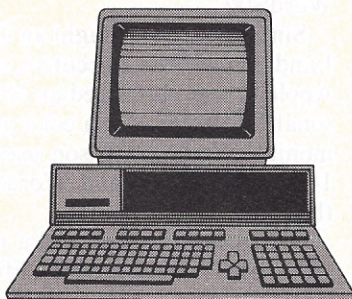
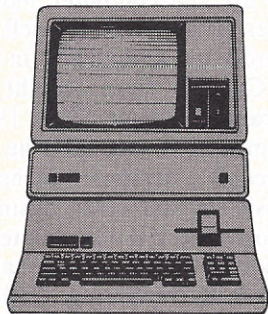
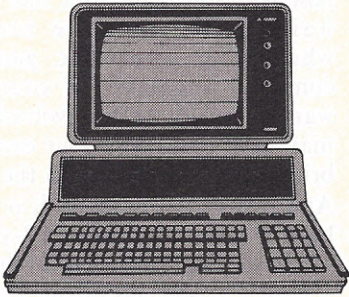
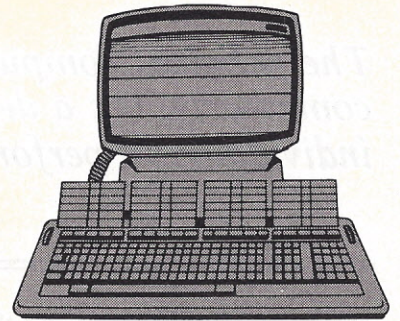
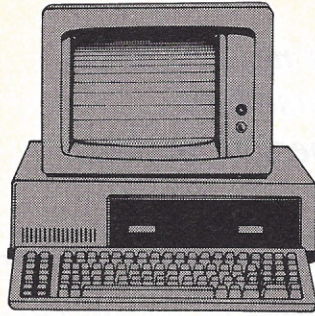
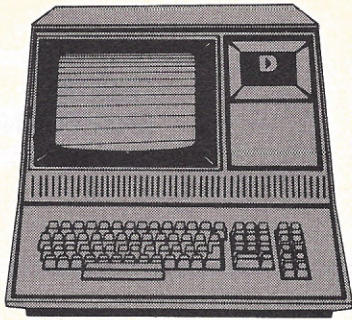
Carlson first bought a Vector Graphics System B in 1979 for his company. A year later he decided he needed a computer at home to run VisiCalc and other business-related programs. He also wanted to introduce his two young sons and his wife Linda to computing. Carlson bought VisiCalc and an Apple II Plus, and soon added more memory and a CP/M card so he could run WordStar.

Since then, he's bought an Osborne I and an Osborne Executive, sold the Apple II and purchased an IBM Personal Computer with a color graphics monitor. Today, Carlson uses Lotus 1-2-3, dBASE II, and WordStar on the IBM.

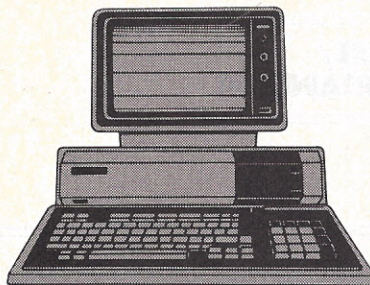
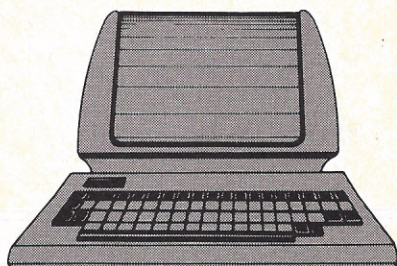
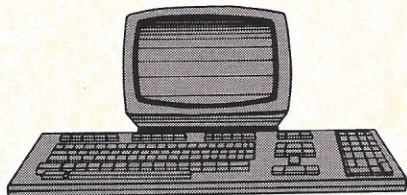
"The computer has had a tremendous positive impact on my life," says Carlson. "I'm always chomping at the bit to sit down and work on it." As wife Linda says, "How often does Paul use the computer? A better question would be how often does he *not* use it?"

Paul seems to head to the computer whenever he has a spare moment, and Linda has learned to live with the situation. In fact, while this level of obsession may be irritating to people who are not heavily involved in computing, Linda admits upon reflection

(continued on page 83)



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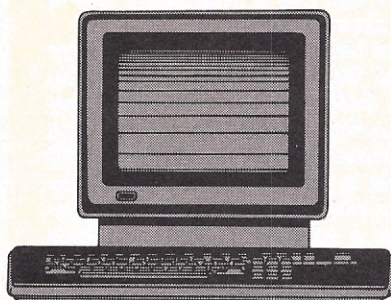
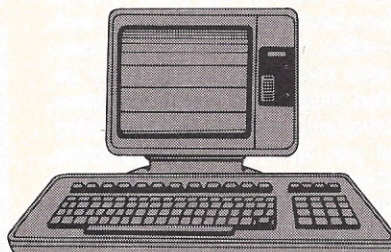
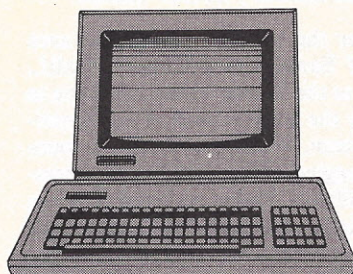
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COPING WITH THE SILICON SYNDROME

by Paul Bonner, Senior Editor

Over the last few years, that area of Santa Clara County, Calif., known as the Silicon Valley has come to embody the latest version of the American Dream. While the rest of the country struggled with a debilitating recession, Silicon Valley enjoyed a boom economy reminiscent of the gold rush of 1849. Fortunes were made and empires built as every day new examples of the most exciting technology the world had ever seen poured forth from the hundreds of electronics and computer firms that gave the valley its name. So great has been its success that when futurists look for a model illustrating the hi-tech, white-collar, brainpower-oriented economy with two computers in every garage that they see as America's future, they invariably point to Silicon Valley.

And yet, upon closer examination, something seems to be amiss in the valley. Oh it's exciting for those involved in the new technology, and there's plenty of money to be made, but there are also some very real problems there: A divorce rate far above the national average. A high rate of drug abuse. And of child abuse. Why?

Jean Hollands, founder and director of The Good Life Clinic in Mountain View, Calif., has come up with an answer to that question through her work as a counselor and therapist for 3000 couples in the Silicon Valley. Her answer is what she calls the Silicon Syndrome: a marriage in which the male partner, usually an engineer or scientist, is over-involved in his work to the point of neglecting and thus endangering the marital relationship. She recently published a book on this subject called *The Silicon Syndrome: A Survival Handbook For Couples*, (Coastlight Press, Palo Alto, Calif.). While the book frequently makes reference to the problems specific to Silicon Valley, much of what Hollands has to say is equally relevant to any family in which the presence of a computer in the home has extended the potential work day to a full 24 hours.

In an interview with *Personal Com-*

puting, Hollands said, "I think you'll see most of these problems throughout the country. Because once one person gets the computer fever, it really has a devastating effect on a relationship."

The problem, Hollands says, is that "The man who has been dealing with seven-figure numbers all day, or the man who has been dealing with designing a new program, is excited about what he's doing, and things at home are a little dull by comparison." The situation is exacerbated when "He has a computer at home and works at it there as well as working on it at the office... it's discouraging for the woman when the man brings a computer home for the weekend."

Further complicating the situation, Hollands says, is the fact that the type



Photograph by James Mason/Black Star

Jean Hollands offers counseling and therapy to couples suffering from the "Silicon Syndrome."

of individual who becomes enraptured or totally involved with computers tends to be "more detached, more reserved, more emotionally quiet" than the norm. "He has very few personal skills in communication. If he was highly skilled in it and could have fun and be joyful and be a good communicator then it would be alright for him to have this distraction, but if he isn't it's going to be a problem for the relationship."

This kind of over-involvement with technology at the cost of human rela-

tionships is largely a male phenomenon, Hollands believes. "Women use the computer as a tool. They use it for the end result. The man in general uses the computer as a companion and a co-worker that's interesting and exciting and stimulating... the idea that the machine is rational and logical and programmable is exciting to him... His partner and his children are not programmable, they don't jump when asked to, and they're not even rational—you know, there isn't the predictability in a family that there is in a machine."

When a marriage is endangered by one partner's obsession with the computer, Hollands believes "Both sides need counseling. She needs counseling to discover that she's ok, it doesn't have anything to do with her. If she were Sophia Loren he would still be on the computer. He needs counseling about the fact that beyond the computer he's got some interpersonal communications skills to learn. He's got to compromise. How about every other night on the computer, or how about only from 8:00 to 9:30, and then after 9:30 let's spend some quality—her kind of quality—time visiting with one another, being romantic, or being communicative or romanticizing. Playing together."

The classic response to that suggestion would probably be, "I can't afford that time, I'm doing all this for us anyway." Hollands retorts, "You can't afford not to, because your marriage or your relationship depends on giving that extra one-third of you back to the marriage... The woman has to say, 'I know you're doing it for us, but there are several us's about us, and one of them is our connection. Although we need the money and we need the prestige, we also need to stay connected.'"

Hollands also tells her clients that pointing fingers will do no good. "In California we have a no-fault state. Nobody's at fault in a marriage. So as a counselor I say to the couple who has this dilemma, 'It's not his fault, it's not your fault, it's not even the computer's fault. But you have a problem and you have to find a way to translate the problem and negotiate for some results and repair the damage. Repair the emotional damage.'"

A good way to integrate the computer into the household is to spread your enthusiasm to the rest of your family.

(continued from page 79)

that it's probably a good thing. "Someone needs to be obsessed with computing in order to act as a catalyst to get the rest of the family started," she explains. "I know some families who are planning to buy a computer just because it's the thing to do. I think they'll have a hard time really getting involved in computing. Sometimes computers are made to look simpler than they really are. They're not something you just turn on and they do magical things by themselves; you need someone who's hooked on computing to get you past the initial frustration."

Getting your family involved is one way to limit the tensions caused by one member of the family spending so much time at the computer. If you can spread your enthusiasm to the rest of your family, you'll be on the way to integrating the computer into the household and removing the resentment the family might feel towards the new machine. When it comes to getting kids involved, games are a good place to start.

"In order for children to learn computing, you have to get them hooked at their own level," says Linda Carlson. "Games are great for that. They teach kids to type and interact with the computer, and that makes it easier for them to go on to the next level."

For the Carlson boys, the next level has been WordStar, which they use when they're doing school reports. Carlson has also designed spelling games for his children, as well as purchased educational software for his kids. He's also recently subscribed to the Plato Homelink Network from Control Data, which lets his kids tap into educational courses and games from the Plato educational library. If you have an IBM Personal Computer with a color graphics monitor and a modem, you can tap into over 270 educational courses and games from the Plato educational library and have them loaded directly over the

phone line onto your system. The initial subscription fee is \$50, and on-line time is \$5 per hour.

The network seems like a good answer to parents who, like Carlson, want their children to use the computer more. Tapping into an on-line data base is, in itself, a practical educational exercise for a child. You gain a special insight into computing when you reach into an electronic network and bring information into the home. And the wide variety of educational material available over the network means there is less chance that a single game will become boring through overuse. You can get more information on the Homelink Network by calling toll-free (800) 233-3785 in California or (800) 233-3784 in the rest of the country.


There are other steps you can take to ensure that the computer becomes a valuable member of your family rather than the object of competition or resentment. Eugene Galanter, founder of the Children's Computer School in New York City and author of several computer books, suggests you choose your first home computer very carefully. He advises against buying a low-end game playing machine, unless you're sure that that's all you want. What happens is that the family gets its introduction to computing through games, but that obsession quickly wears off. When you want to move on to higher computer applications, you're stuck with a machine that has limited capabilities beyond thwarting alien attacks. You're then faced with the options of either buying a second, more elaborate computer, or sticking to games. Galanter feels it's better to reverse the scenario and buy a computer with greater capabilities first, and instead of using it as a game-playing machine, buy a second, low-cost system later.

Another mistake you can make is to become stuck on the first application you master, whether it's word processing, spreadsheeting, or game

playing. "The computer is not a single-purpose appliance," says Galanter. "We figure out how to use our dishwashers or vacuum cleaners and we don't have to think about them any more. But a computer is much more pervasive. I know people who use their computers only for word processing or to access CompuServe. You should not . . . use the computer as a dedicated device."

"When you buy a computer for the home," adds Jerry Willis, "you should identify a primary use and several secondary ones as well. But don't try to make it the universal machine. What you're looking for is a system that fits your immediate needs, and is expandable at a reasonable cost."

The personal computer is just beginning to impact on the American home and family. In homes where computers are heavily used, it is primarily to enhance an individual's profession. Scenes where the entire family huddles around the computer and stares in wide-eyed amazement as the wonders of the new age are revealed are largely fiction. What happens instead is that one person usually gets hooked, and then tries to encourage other family members to use the machine. And if he or she is successful, chances are that the family will soon be shopping for a second computer.

Understanding how you, as an individual, can use computers takes time. The business applications are obvious: The computer can help you to be more productive, and therefore, make more money. Other applications may be more subtle. Sure, you can play games or type letters on the computer, but integrating the machine into your life so that you can use it on a regular basis takes time and maturity. You have to ask yourself, "What is it that I do, and how can I do it better?" Only then can you understand the limits and the possibilities of the personal computer. 

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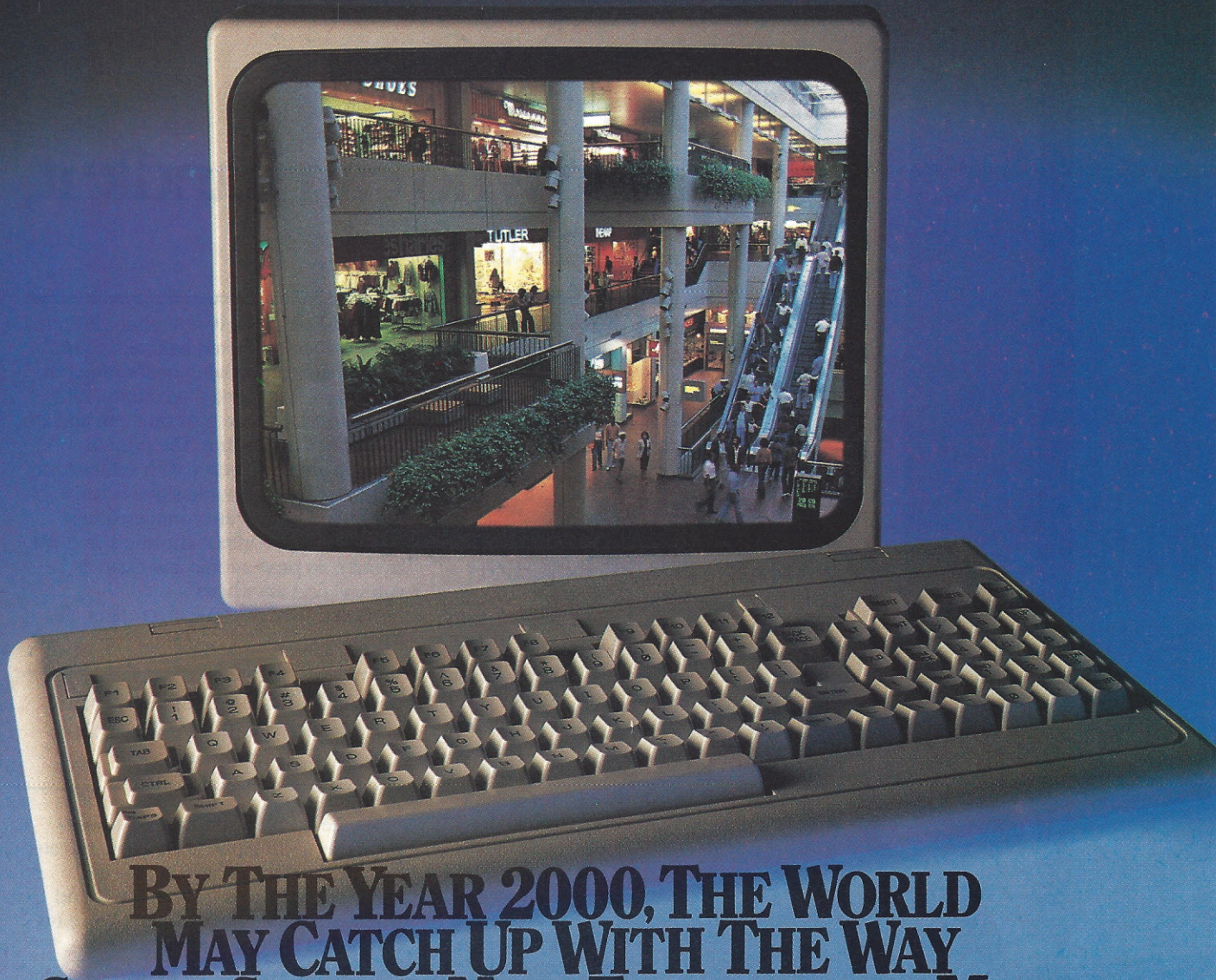
Is the Epson a simple, easy-to-use computer for beginners? Or a sophisticated high-performance computer for the experienced? The answer is "yes." And when you think about it, aren't those two computers the one you need now.

For technical specifications, and the complete, 3-part *Microcomputing* review, along with the name of your nearby Epson dealer, call toll-free (800) 421-5426. California residents, call (213) 539-9140.

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The Coming Of Age Of “Smart” Software

A new breed of software holds out the promise of an easier partnership between mind and machine

by Charles Rubin, Associate Editor

People have been making decisions forever, and they've been making them with the assistance of computers for nearly 40 years now. But the role of the computer in the decision-making process really took off when computing power came to the individual in the form of the personal computer. Here was a tool that combined the elements needed for decision-making—large amounts of data and the ability to manipulate that data—and presented them in a

way that allowed individuals to explore possibilities and test out theories before making a choice. The more we used computers, the more we came to understand their potential, and that understanding pushed us to find still more uses.

But an interesting by-product has come out of this maturing process: The more we use computers, the more we demand of them. While it might once have been adequate to simply get limited forms of answers

from computers, their improved flexibility and availability have caused us to demand a more seamless partnership with them. The rigid command sets, separate applications, and processing delays that were acceptable in the pioneering days of personal computing are not so easy to tolerate now that the computer has become an important part of our working life.

We no longer stand in awe of raw power, but have begun instead to seek out better ways to get at that power,

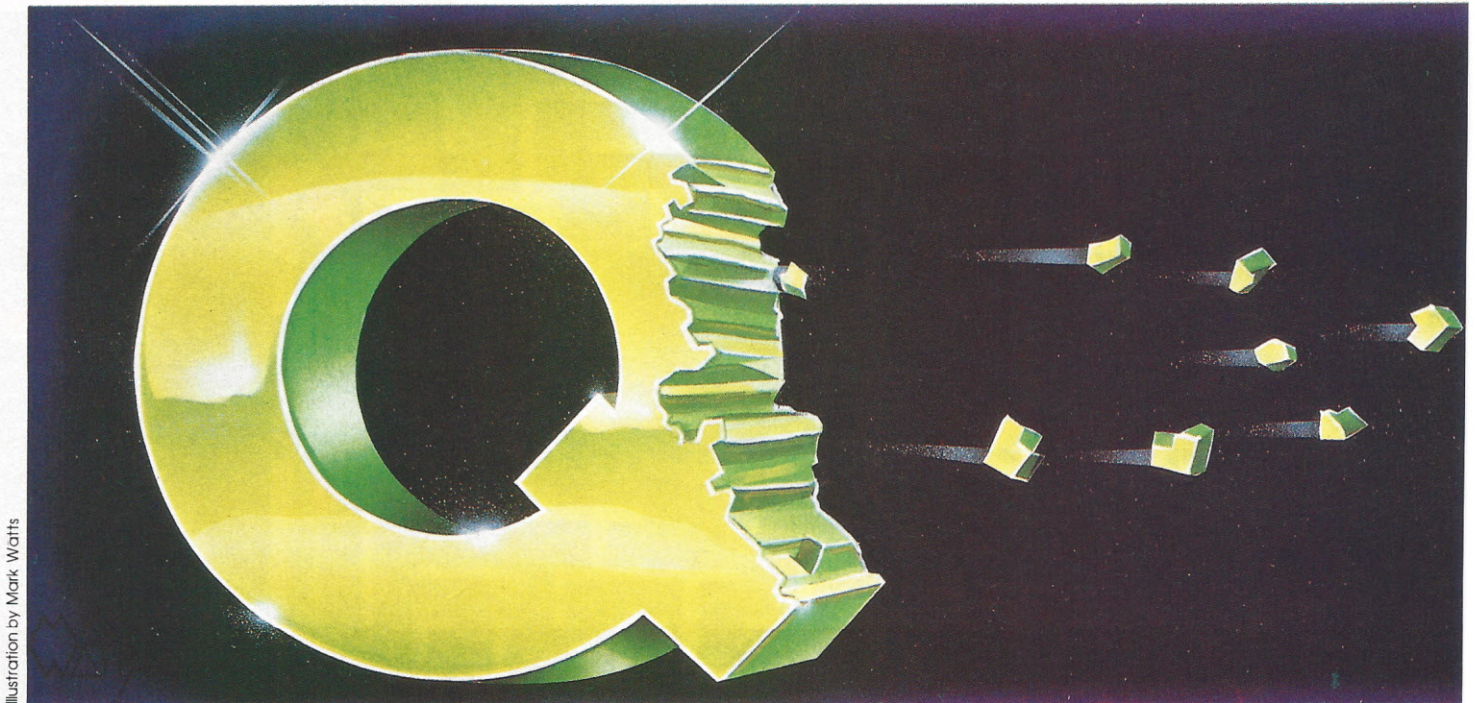


Illustration by Mark Watts

PERSONAL PRODUCTIVITY

in whatever quantity and quality suit the moment, instantly and effortlessly, whenever we want it. The novelty has worn off: Why, we think, should it be necessary to spend hours learning to build spreadsheets and hours more building them to analyze numbers to meet a goal? Shouldn't it be possible to simply enter the goal and let the spreadsheet build itself?

Our intimacy with personal computers has bred a desire for even greater intimacy, a closer harmony between our mental power and the power locked up in our computers. But command sets and formulas seem to stand in our way. So we find ourselves facing a new challenge: We've learned a lot about how computers work—about what they do best. And we know a thing or two about how people make decisions. Now, we have to figure out how to integrate the two.

In an industry blessed (or cursed) with more than its share of visiona-

ries, it's no surprise that the problem of effectively integrating computers into our analytical processes is being tackled from all sides. Integrated software, desktop metaphors, pull-down menus, mouse pointing devices, and even voice recognition testify to industry's attempt to bridge the human/computer gap, and the increased interest throughout the industry in addressing human needs shows no sign of abating.

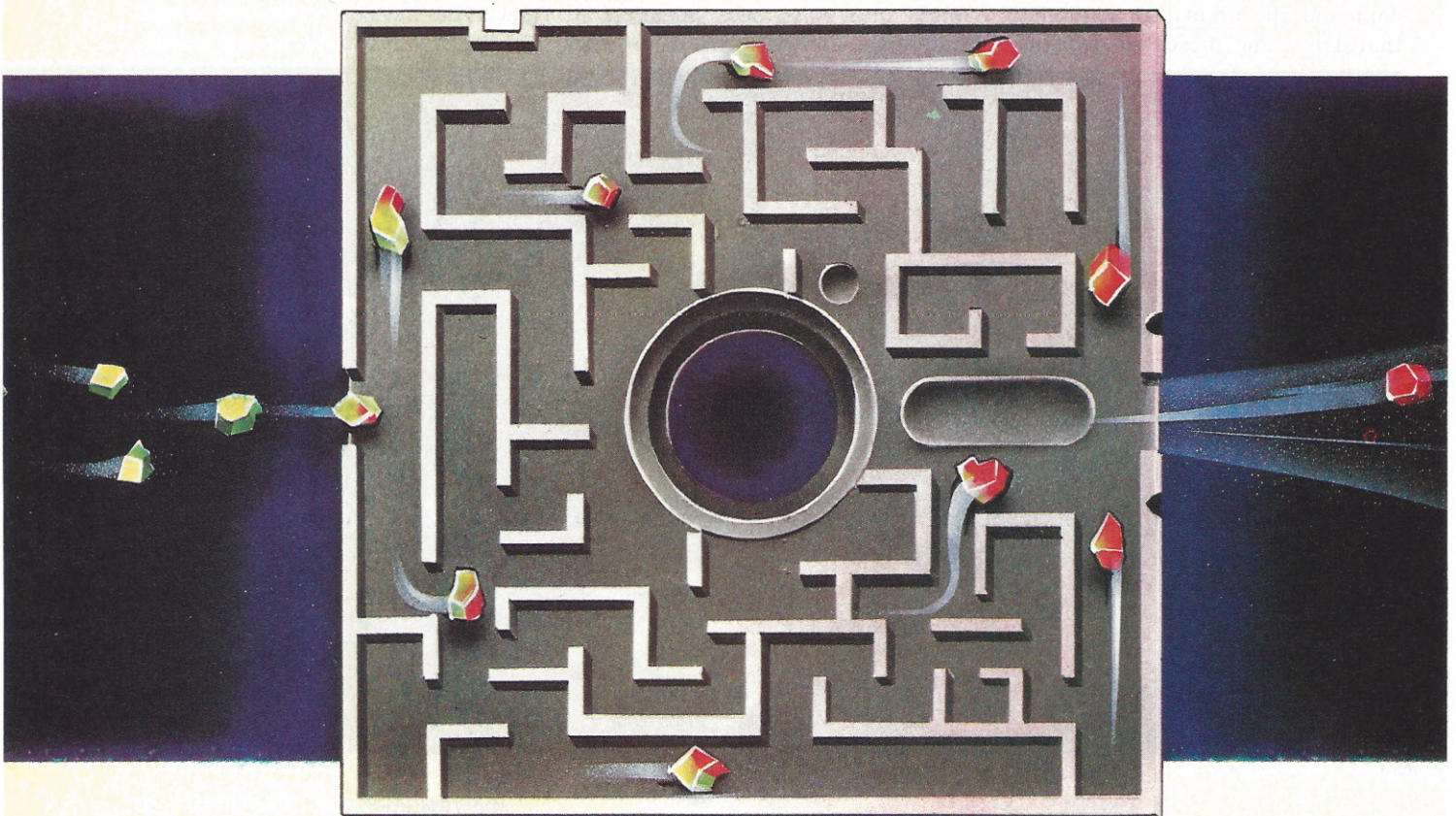
Within the past two years or so, software and hardware developers have taken a more qualitative approach in seeking better products for personal computer users. While before it was enough to have more cells in a spreadsheet or greater report-generating abilities in a data base manager, today the emphasis is far more on *how* the software does what it does, rather than simply on what it does—on reducing the number of keystrokes, say, instead of increasing the variety of graphs, or on com-

bining applications, rather than on adding features to individual ones. It's a shift away from *more* computing toward *smarter* computing.

But what is the road toward smarter computing? To know that, we need to know what it is we get from computers besides simple information—what do we gain or lose in the *process* of computing?

One way to approach the problem of computer-aided analysis and decision-making is to take the historical perspective. How have computers, especially *personal* computers, changed our thinking processes? If we can identify the changes, we can begin to understand what needs to be done to create a more harmonious partnership between people and computers.

In the pre-computer days, we analyzed problems and made decisions by gathering as much information as we could, and then sifting through it for an answer. Depending on the



The personal computer has become a high-powered partner in the decision-making process.

amount of time needed to gather and sift the information and the time we had to make the decision, the sifting process varied from laborious hand calculations and research to almost pure guesswork. If we were going to make a genuine attempt to find facts to support a decision, the process of getting the facts was so tedious that we had to decide *in advance* just exactly which facts we were looking for and roughly what they would look like when we found them. In any case, there was a barrier between ourselves and the information we needed to gather in order to make an informed decision.

Then along came mainframe and minicomputers, which supposedly allowed us to manipulate information better. In theory, they did; but in practice the structure of the MIS department and the need to form priorities and share computer time with the rest of the company made detailed manipulation of information impossible. We were still forced to decide in advance just which answers we could or couldn't get from the

minicomputer, just as we decided which we could and couldn't get from the clerks or card files before them. Again, it was a matter of limited power and time that held us back—the bulk of our time and efforts was still directed at simply getting the information rather than at manipulating and analyzing it.

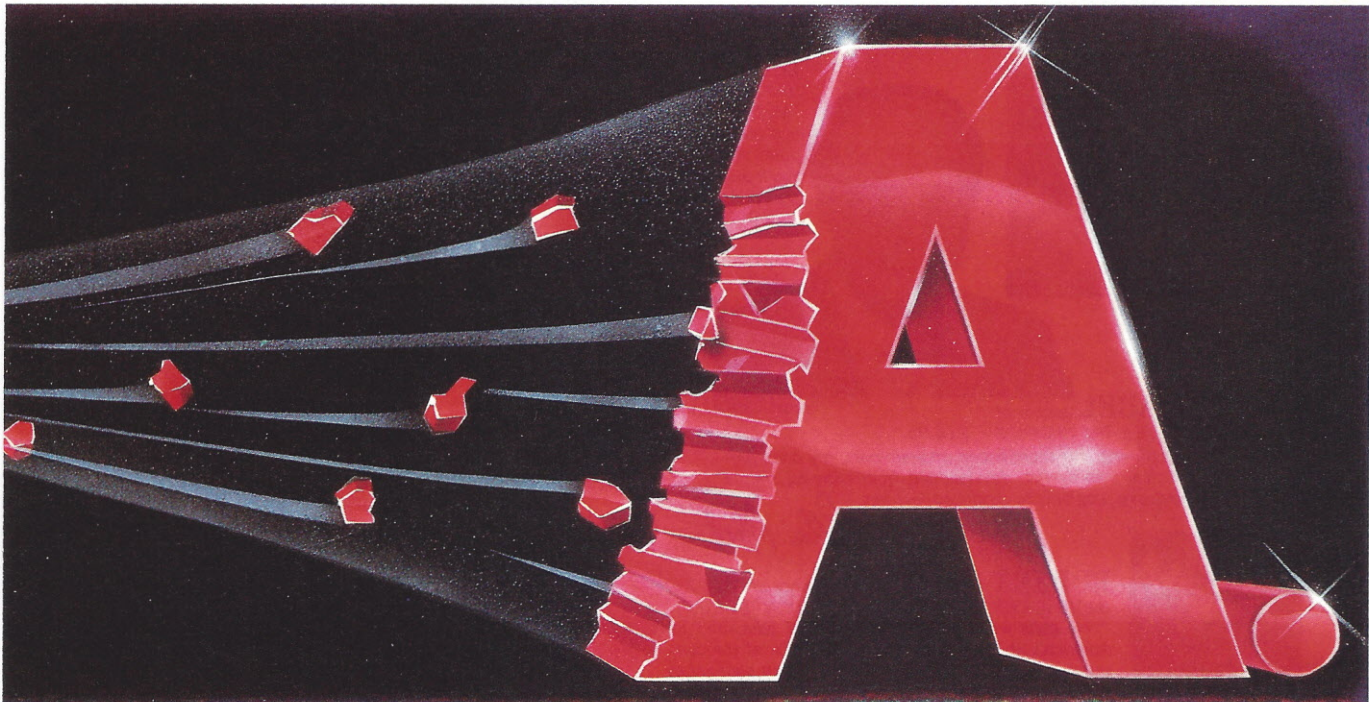
But personal computers have lifted many of the restrictions that held back our decision-making powers. For the first time, we actually have the power to manipulate information—large amounts of it—quickly enough for the manipulation to be useful in the decision-making process.

For the first time in history, we have a tool whose capability for analysis and flexibility is beginning to approach that of our own minds. No longer bound by preconceived notions of how to approach problems, we use spreadsheets, for example, to build models or frameworks with which to analyze the problem. And often, our focus is not as much on the result as it is on creating an environment in

which the problem can be thoroughly analyzed.

This development represents a major shift in the way we approach decision making, and as such, it has sparked a debate within the personal computer industry: Is the process as important, or maybe even more important than the outcome? Should we be working toward software that facilitates the analytical process, so it becomes an integral part of the decision-making process, or should the direction be toward automating that process so the user hardly thinks about it, concentrating instead on reaching the goal he is seeking?

"We're all more interested in the goal than in the process of achieving it," says Charles Simonyi, manager of applications software development at Microsoft. "Our short-term solution to this problem is our Expert System products, which are largely vertical-market applications for Multiplan that perform specific tasks, such as cash flow management and budget analysis." The Expert Systems packages prompt users



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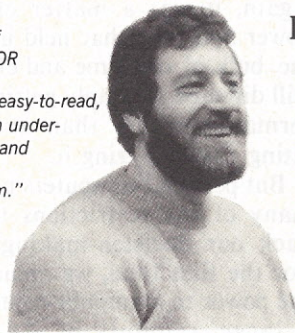


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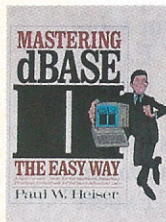
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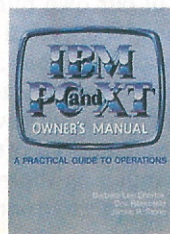
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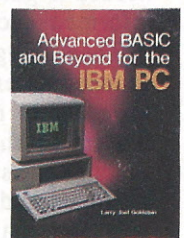
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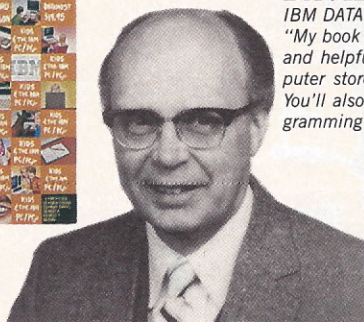
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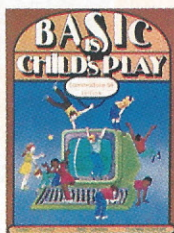
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*Software and hardware developers
are shifting away from more
computing toward smarter computing.*

PERSONAL PRODUCTIVITY

through a series of financial questions and then automatically generate a Multiplan worksheet based on the answers. The approach is clearly goal-oriented, as it largely frees the user from the need to learn any Multiplan formulas or formatting commands. A spreadsheet that might take hours to design and build can be generated in as little as half an hour.

This kind of product reduces the user's involvement in the *process* of analysis—the creation of models, the setup of relationships and formulas—and lets him concentrate on its outcome. But the power of this approach is limited. The Microsoft Budget program, for example, will only create budget worksheets—you can't use it to work on a cash flow analysis. The other packages are similarly limited in function. "The current Expert Systems are very vertical," Simonyi says. "The short-term solution is to make the number of our vertical systems much larger. The long-range goal is to achieve the power of these systems and spread it across a broad area of applications."

Automated analysis

Broad applicability is a hallmark of most traditional spreadsheet products, and new ones that are touted as decision-making aids tend to approach the ease-of-use question from a different point of view. The assumption is that building spreadsheets is inevitable, and the answer is to make that process easier without limiting function. The specific implementation of such an answer varies from one product to another.

"We took two steps that aren't available in other calc products," says "Dash" Chang, president of Chang Labs, publisher of MicroPlan. "First of all, the majority of people feel uncomfortable typing, and with most calc products, you have to enter the formulas from the keyboard. MicroPlan can be operated entirely via the numeric keypad.

"The second step is built-in formu-

las. People don't think in terms of formulas, and having to translate what it is they want to do into a series of formulas is an extra step in the analytical process. I used to train corporate users of computers, and that's where I learned that people think in terms of this group of numbers and that group of numbers, not in specifics of Row 1 or Column A. Built-in formulas help people concentrate on what they want to do, instead of how they're doing it." Instead of locating a certain row and entering a formula into it, MicroPlan users select a formula or other spreadsheet function from a menu and then answer prompts about which section of the spreadsheet the function applies to. Built-in formulas eliminate the need for users to learn and memorize commands, and the 10-key command interface helps make using the program transparent to non-typists. In taking the user's own probable workstyles into account, Chang's products try to live up to a packaging slogan that describes them as "software that works like you think."

Of course, the ease-of-use features in MicroPlan may reflect Dash Chang's own analytical method as much as anyone else's. He points out that spreadsheets are great for him, because he thinks of problems in terms of ratios. "If I'm projecting sales for a product," he says, "I don't need a spreadsheet to come up with a number, say 10,000 a month. But if I want to quickly test the reality of that number, I have to break it down, by sales per store, or per distributor, per month; and I need a spreadsheet to do that. And once I've found a realistic number at the store or distributor level, I can recalculate the spreadsheet to see what that equals in total monthly sales."

Open Access, a new integrated software package from Software Products International, takes a different approach to the user interface and command automation issues. According to John Eyerly, director of

sales support for Software Products International, "Goal-seeking is one of five major features that separate our spreadsheet from the others," he says. "It's designed to complement the traditional what-if spreadsheet method. Traditionally, a spreadsheet user would sit down to analyze a problem and say, 'I'll try this combination,' and watch the result. And maybe the numbers would be a little off, and he'd try another combination, and the result would be a little off the other way. The user finds himself juggling a lot of numbers trying to come up with the ideal combination to reach a goal. What our goal-seeking does is turn that process around and say, 'I need this,' and let the program figure out the best way to get it."

The program lets users specify up to five independent variables, which will automatically be adjusted to meet the goal. If the user doesn't like the first solution, the sheet will recalculate another option. This automation frees users from complex calculations without eliminating them from the modeling process completely. "The problem is that it's very complex," says Eyerly. "When you try your own combinations of numbers, you may or may not be taking the whole sheet's interactions into account. You could try a combination that hits what looks like a high point toward meeting your goal, but it's actually only a local maximum, rather than a global one. Something that seems like the best solution might not be. You might not ever come up with the best solution."

While it automates the what-if process, the spreadsheet in Open Access still requires users to know the formulas, formatting, and movement commands to build the spreadsheet in the first place. One way the program strives for transparency in this area is through the use of command menus and a mouse pointing device. Locating the cursor on the screen with the pointer requires less thought than

Should we be working toward software that facilitates the analytical process, or that automates it?

scrolling around using cursor control keys, and selecting commands from menus helps minimize the number of keystrokes users must remember.

But as we've said, there are two sides to this story. While some developers and users argue for making the process transparent, others favor a radical move in the opposite direction. Not only do they think the process should remain visible, they are working to make it an important part of the whole exercise.

Eric Rosenthal, an assistant professor at the Harvard School of Business, spends a lot of time teaching computer modeling. He sees the building of models as an educating experience. "That's the difference between the personal computers and the mainframes—the fact that you're building something, and seeing the results as you go along. It helps people build intuition about a problem, so they end up exploring different areas. You don't want to make the stuff too "cookbook," too automatic—I think that's why templates haven't caught on in a big way. There's a positive influence in building your own model."

But Rosenthal admits that making the process easier would help. "I'm all for building models more quickly," he says. "What would help is if programs were easier to use—the same user interface, with one disk that's booted once and everything's right there. There's a lot of legwork between the various programs. With 1-2-3, for example, you have to go down trees, and up trees—it'd be nice to go directly where you wanted to. It would be more like your mind works."

Most of these solutions are attempts to translate the computer's method of operating—the world of numbers and typed commands—into something that's more natural to the user. The problem, of course, is that what's natural for one person isn't necessarily natural for the next. Researchers at Xerox's Palo Alto Research Center (PARC) and Steve

Jobs at Apple Computer seem to agree that the mouse pointing device is a universally natural interface. Other manufacturers and researchers are not so sure. Spreadsheet software companies insist that rows, columns, and numbers are the ideal analytical environment for the broadest range of business users; others disagree. An increasing number of companies are attempting to give users a choice by integrating spreadsheets, data base management, and word processing.

Ideally, what's needed is software with a flexible command processor that would let the user define (or better still would automatically learn from the user) the way the user likes to communicate—whether through letters, numbers, or graphics. This solution is beyond our current means, although there are some integrated packages on the horizon that promise "modeless" operation—the ability to move from one application to another without knowing you're doing it. One product that allows some user customization of the command interface now is Micro DSS/A, a statistical analysis package from Addison-Wesley.

The package, which has been out on the Apple II computer for about a year and more recently was released for the IBM Personal Computer, is built around a data base management and graphics package. It was designed by three business school professors to function the way a typical manager works in performing data analyses. Says Joe Hayes, a sales representative for Addison-Wesley, "It's a manager's tool. The program lets managers work with either a self-entered data base or one they've downloaded from a mainframe. It allows users to define sections of the data base as terms, and then combine the terms in an almost infinite variety using simple verbs. Say the financial manager of a retail chain has a data base containing information about all the stores in the

chain. Let's say there's historic data on every store, that had been defined as AGE, Sales information per store, defined as SALES, demographic information defined as BUYERS, and physical information about the stores defined as SIZE.

"The manager might say, 'I wonder if there's a correlation between the ages of the stores, their size, and their sales. He would type CORRELATE SALES (for whatever year), AGE, and SIZE. The program would print out a correlation—either in matrices or in pairs of those variables."

Users can also define new sections of the data base, says Hayes. "You could take variables like SALES and SIZE and combine them to create a new variable. You could say, for example, SALES DIVIDED BY SIZE EQUALS SALES/SQUARE FOOT, and the data base will then have a new variable called SALES/SQUARE FOOT.

"It's designed for ad hoc analysis," Hayes says. "It handles the calculating part. The executive would need to understand the need to correlate something in the first place, but wouldn't need to make a spreadsheet do the correlation. Most people use spreadsheets for this kind of analysis because that's the only way they know how to approach it. What they really want is something where they can create variables like this and do correlations without having to spend all their time crunching the numbers." Hayes mentions one example, a large hospital supply company with field sales representatives. The reps could download sales information from the company's mainframe and determine average sales per hospital, whether there was a correlation between the number of calls per hospital and sales per hospital.

Other data base programs that allow customization of the query and command language to certain degrees are R:base 4000, from Micro-*rim*, and Savvy, from Excalibur

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What seemed to be special rituals of computer power now strike us as intrusions in our analytical processes.

PERSONAL PRODUCTIVITY

Technologies. Texas Instruments has taken a different approach to the natural language interface challenge with its voice recognition system. But all the difficulties with command sets, formulas, and identification of information seem only isolated aspects of a larger barrier between mind and machine: integration of applications. When we turn problems over in our minds, we can instantly skip from relational to linear thought, from numbers to pictures to words. We can express the same idea—the number four, for example—in dozens of different ways, each of which might be suitable for a given situation. The iron rigidity with which computers perceive, interpret, and report information stands in direct conflict with the elasticity of the human mind, yet here, too, we struggle toward a solution.

Integrated software, in its various forms, is the current method of making computers more flexible in their interpretation of data. Data can be passed from a numeric program to a verbal program, or from a graphics program to a verbal program with seeming ease—the software gymnastics are going on behind the scenes. Nevertheless, having anything approaching the ability to combine diverse representations of data is a giant step toward making computers emulate the mind. Central to bringing the illusion off, however, are speed and ease of use. Any processing delays of disruptive switches in command sets interrupt the illusion of seamless flow from one function to another. The chief examples of such integration these days are Apple's Macintosh and Lisa, Microsoft's Windows interface manager, Quarterdeck's DesQ, and VisiCorp's Visi-On. Others will surely follow, each of which will promise speed, data interchange, and standardization of commands that is ever more human and less computer-like.

But what does integration really do for the analytical process? Its great

promise is in lowering the computer's profile to the user. Suppose you're in the throes of analyzing your budget for the coming year. You have to get last year's numbers from the data base, build a model, and look at what you can do. An integrated package might let you load the data base numbers directly into a spreadsheet model, where you could manipulate them and then get a graphic representation of the spending levels instantly at the touch of a button. All during this process, you're focused on the budget itself. Now, the old way would involve booting the data base manager, getting the data, booting the spreadsheet, using a file transfer utility to move it into the spreadsheet, manipulating the numbers with a different set of commands, saving the result, booting a graphics program, specifying the kind of graph, and looking at the visual. Each transition between commands, each rebooting of a program, each file transfer, is an interruption that breaks your concentration on the budget at hand. Instead of thinking maintenance figures, you're thinking file names and graph specifications. The act of computing intrudes too rudely into the analytical process.

Integration holds out the promise of a far easier, more transparent computing experience. One software package to boot, one command set to learn, file transfers that take place automatically. Unfortunately, in their quest for market share, manufacturers of such software may find themselves selling the sizzle instead of the steak. Knowing that buyers respond to color, for example, software designers may spend too much time on the look of a program, and not enough on its function. Some integrated programs, like Intuit and Dayflo, for example, offer fairly high degrees of integration and a lot of functionality, but lack the colorful displays of Open Access or DesQ. This doesn't make them less functional, it makes them less market-

able. On the other hand, graphics can be overdone. Other packages sacrifice the functionality of individual programs for the overall integration of the group.

All of these approaches have their supporters and detractors. Without an overall perspective on the problem, though, there's a danger that what began as studied attempts at improving decision-making end up as features wars between software manufacturers. Enhancements which seem at first blush to be good ideas can actually hinder the human/computer relationship. A case in point is the graphic calculator in Apple's Macintosh. You can call up a graphic depiction of a calculator in the middle of a spreadsheet screen, and then use it like a real calculator to do math. The result can then be copied into the spreadsheet via a temporary storage area in Macintosh. This seems like a great idea, but in practice it's easier to use an actual calculator for such things. By the time you "hit" the graphic calculator's keys with the mouse pointer to enter and calculate your number, copy the result to the temporary memory and then into the spreadsheet, you could easily have used a real calculator and entered the number yourself. Such a device adds unnecessary clutter to the analytical process—instead of being an intuitive aid, it's a distraction.

Personal computers may one day be wallet-size boxes that communicate telepathically with us, responding to our thoughts in whatever form they may take, finding and manipulating information from worldwide data bases, connecting us instantly to anyone else on the planet, helping us organize our own thoughts in ever more effective ways. For now, we can only make use of these first small steps toward full integration of computers into our analytical processes. The problem has at last presented itself, however, and we have made a start. 

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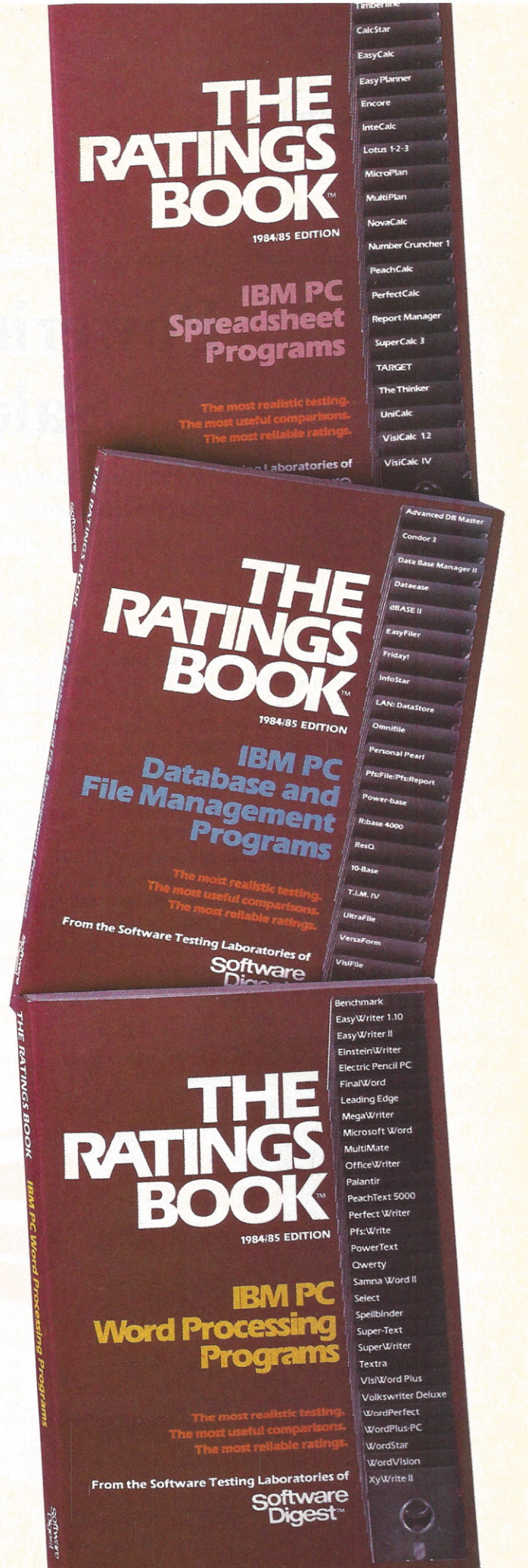
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CIRCLE 150



Powering Up Your Sales Force

Personal computers can make your sales department more efficient, more productive, and more profitable

by Richard Clucas

To people in the sales field, getting out and making the sale is the name of the game, and today, with the growing development of sales-oriented software, sales personnel are beginning to look to personal computers for help. While the computer and software can't convince an unreceptive customer to buy a product he doesn't need, they can provide invaluable benefits for sales personnel in everything from large corporations with extensive sales networks to

Richard Clucas is a California-based free-lance writer.

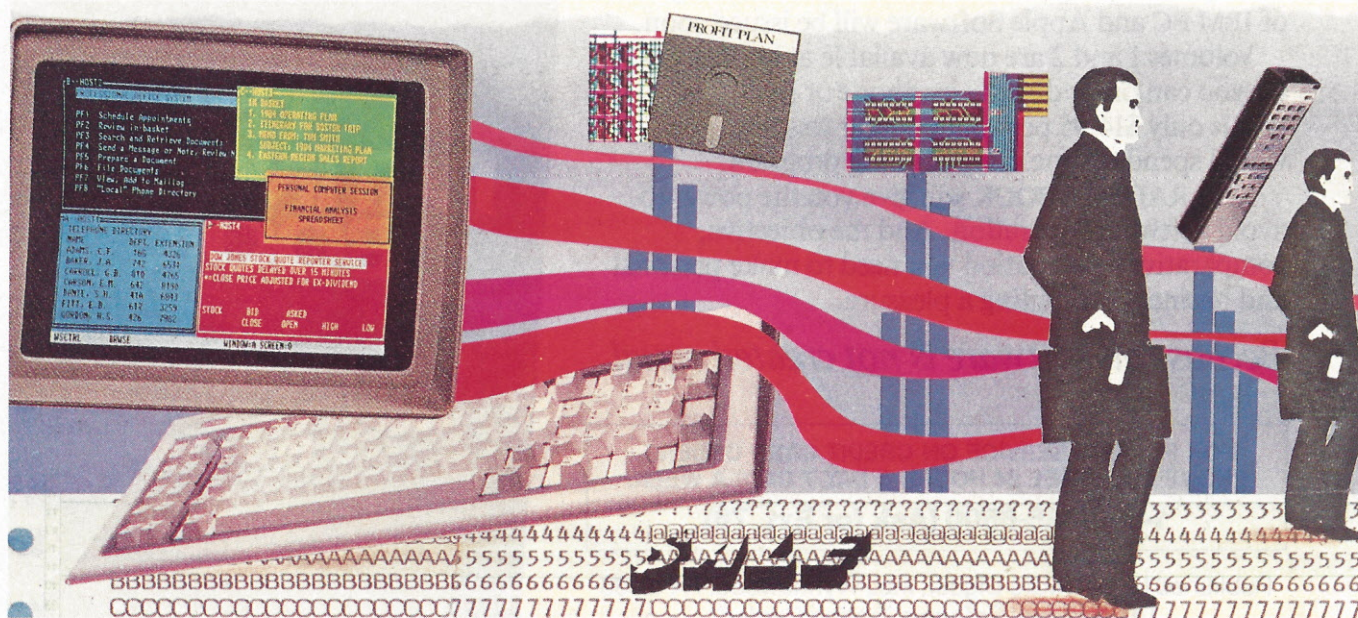
small, one-man companies. Ideally, personal computers should help sales representatives speed up the administrative "grunt" work, while providing sales managers with an important tool to evaluate sales situations and improve results.

A spokesman for the Grid Systems Corporation in Mountain View, Calif., for example, told us that one of the nation's leading pharmaceutical corporations began using the small briefcase-size Grid Compass computer in its sales department in Chicago early last fall. Though the company asked that its name not

be used, its experiences can provide a good example of how personal computers can be used in a large corporation to help its sales force gain direction, and become more productive.

The sales department at the Chicago corporation is highly structured. At the top of the company's sales hierarchy is the national sales manager. Below him are six regional sales managers who oversee 54 district managers, and each district manager directs a sales staff of eight to 13 workers.

During an evaluation of the sales



Personal computers can actually be used to improve a company's sales strategies.

department last fall, the corporate sales manager discovered the district managers were devoting 18 to 22 hours a week to paperwork, more than twice the amount of time the corporate manager thought would be necessary. One of the main goals the company hopes to achieve with the computers is to reduce the amount of time district managers spend on administrative chores.

Though the modernization process is only half complete, Grid Systems spokesman Jeff Gould says company officials have been impressed with the results—not only because of increased efficiency in administrative work, but because the computers have actually improved the company's sales strategies.

Focusing on the source

Drug salesmen don't sell directly to the users—that is, patients—they sell to doctors, and doctors can be convinced by a good salesman to prescribe their company's product. So, in its marketing campaign, the drug manufacturer focuses its attention on the doctors and hospitals that dispense the drugs. In the past, when the company released a new product, its

sales tactics were fairly unsophisticated. The company would tell its salespeople to go to the prospects they thought would be most likely to buy, and ask them to specify their company's product(s) to their patients. It was up to the salespeople to develop the relationship with each doctor. That worked just fine; the representative knew just which doctors specialized in what aspect of medicine, and therefore what types of drugs he would be most interested in; which hospitals would use which drugs; what their preferences were, and what the potential would be if a new product were to come out. But because the representative knew the needs of his clients so well, if he quit, the company not only lost him but lost his knowledge of a district, as well. But now, using personal computers, the company can keep as close a track on customers as the representative can.

They accomplished this by developing a program that matches up new drugs with their highest potential market. So, when a new drug is released, the company's central sales office makes two lists for every ZIP code area in the nation. The first list

details how well similar products sold, for either the past year or quarter, while the second list identifies the doctors who would prescribe the drug. This information is then passed on to the district sales managers, who manipulate the data so it corresponds to each salesperson's territory.

For example, when the company recently came out with a new drug for asthma, the sales department came up with a list of all the doctors in each ZIP code area that would treat asthmatics, such as allergists and general practitioners. Next, it generated a list identifying the volume of similar drugs sold in each area. By this process, the company was able to determine where the highest demand for the asthma drug would be, and the names of the doctors who would prescribe it.

"Not only can the sales manager tell his sales representatives who are the top 15 prospects in their territory, but he can tell them the order in which they should contact them," says Gould. "It is a winnowing process that allows the company to develop a small list of prospects with a high potential for buying."



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CIRCLE 107

Sales managers can use computer-generated graphics to highlight changes in salespeople's productivity.

The company also uses the computers to determine if more salespeople are needed in one area, project sales, keep track of personnel records, do more traditional things such as word processing, and to motivate workers. How can personal computers be used to motivate workers? It's easy. The district sales managers use computer-generated graphics to highlight changes in a salesperson's productivity, says Gould.

"When you have an employee who has been working at the same level for several months and then his sales take off, a district manager will print out a report showing exactly when and where the change occurred," says Gould. "Instead of just showing the salesmen numbers, they use graphs to give them a clearer sense of their work. They've found this works much better in motivating them."

Increasing effectiveness

At Hayden Publishing Company in Hasbrouck Heights, N.J., Stacy Barse, publisher of *Microwaves & RF* magazine, is using personal computers in a similar manner to enhance his salespeople's effectiveness. With three other competitors in the market and only 300 potential advertisers, Barse is interested in knowing the amount of advertising his clients are doing with the competition. Using dBASE software on an IBM Personal Computer, Barse has developed a program to measure the amount of advertising appearing in all four publications to determine *Microwaves*'s share of the market for each individual advertiser and for all advertisers combined. By breaking down the market by individual advertisers, Barse can keep track of how each of his five national and five international sales representatives are doing in their respective territories.

"As for salesmen, we ask that each one be the leader in their districts and regions," says Barse. We follow this very closely. Bonuses are given out to salesmen by their share of the mar-

ket. We also look for noticeable changes in advertising budgets and to see if there are any new accounts. Or if we have been ignoring an account because they said they did not have an advertising budget and then we see they are advertising in another publication, we can return to them and sell them advertising."

Before buying the computer, *Microwaves* went to an independent consulting firm for this same service, yet the price of the Personal Computer equipped with a hard disk was less than the price paid to the consulting firm in 1982. For Barse, the computer has already paid for itself by allowing him to drop the service, yet he found other ways to use the computer.

Using survey data provided by *Microwaves*'s parent company, Hayden Publishing Company, Barse does extensive marketing research on the computer to pinpoint specific information about the magazine's audience. From this analysis, which he calls Semantic Differential Research, Barse can learn what perceptions different segments of his audience have of the publication. He can then use this research as an advertising tool.

"We had an advertiser come to us who was not satisfied with his advertising," says Barse. "His advertising staff thought their advertising was not on target. Although the firm was only a small division in a major corporation, they were concerned that by using the name of the company, the reader thought of the product as being high priced, but it was actually inexpensive. When we did some research, we got data back that showed the readers' impressions were in contrast to fact. The readers thought the company had expensive products. Using this data, we convinced the company to begin emphasizing its price in its advertisements."

Barse also uses dBASE II to categorize by topic all the editorial material that appears in each edition. At

the end of the year, he prints out a 50-page report identifying the exact nature of the editorial contents. Armed with this marketing and editorial information, sales representatives can give potential advertisers and advertising agencies a strong argument that advertising in *Microwaves* will get them results.

"What we are doing on our personal computer is old hat to a lot of advertising agencies and larger publications," says Barse. "But it is new to our publication and to our genre of magazines."

Another advantage mentioned by Barse is the ability personal computers give sales managers to determine whether the salespeople are spending too much time on weak prospects, while neglecting better ones.

Barse requires each of his representatives to provide him with some general information on each of their prospects. He then has the salespeople rate each prospect as to their likelihood for advertising. If the prospect is advertising with the magazine on a regular basis, he receives an A. If he's doing some advertising, he receives a B, and so on. Those prospects that the representatives know nothing about are given a D. By requiring his sales representatives to provide him with this information, Barse knows who the potential advertisers are, and the amount of time his representatives are spending with each one. He can then redirect his salespeople to spend more or less time with specific customers.

Keeping track of business

In a similar fashion, Ken Mitchell, vice-president of sales and marketing for California Business Store in Costa Mesa, Calif., uses a Kaypro to keep track of his salespeople.

"Once a week before the sales meeting, I ask each of the sales representatives to provide me with a report on their clients," says Mitchell. "I've got to know who they are working with, what the customer wants, and if

Who Uses CompuPro?

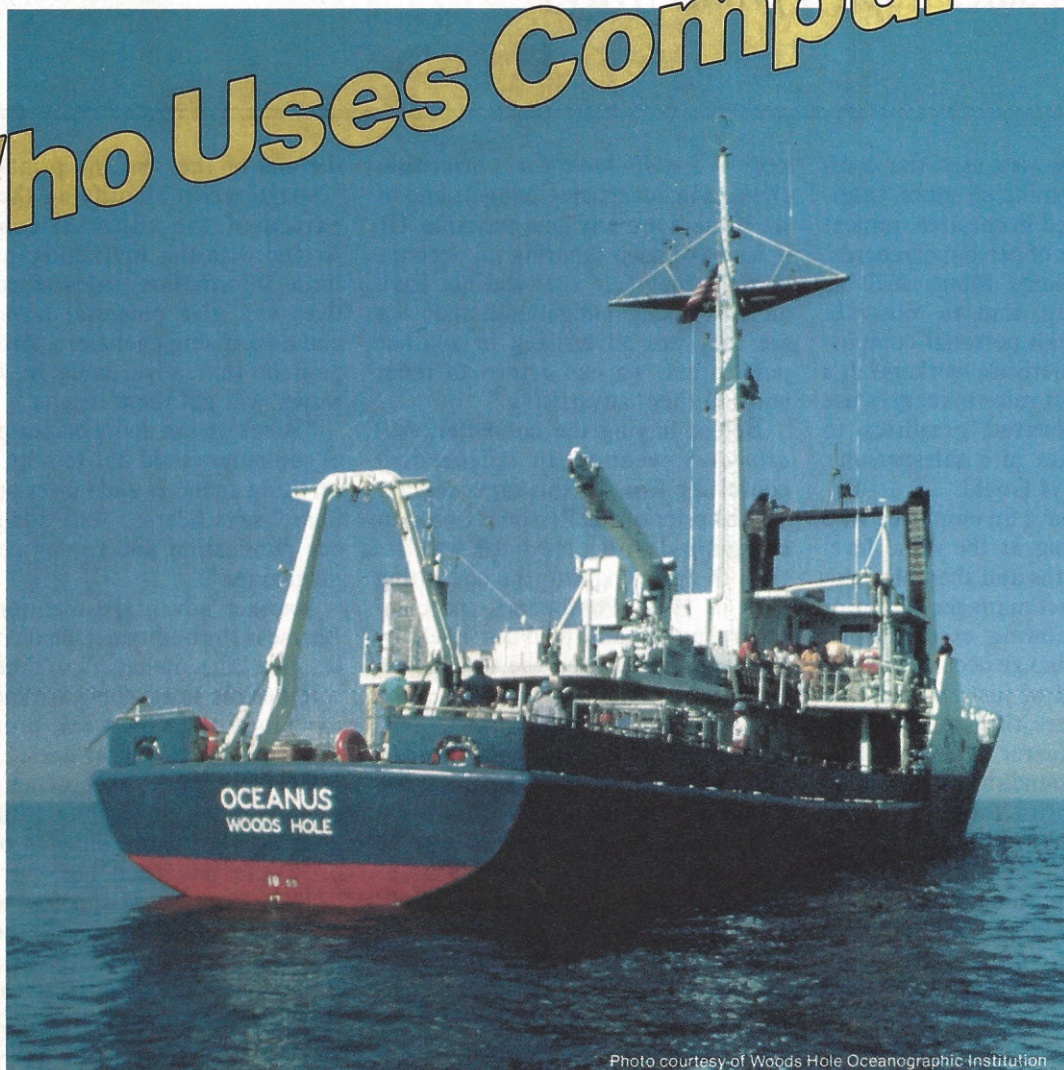


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CIRCLE 118

Using computers, sales managers can determine whether salespeople are using their time effectively.

CORPORATE/ BUSINESS

they see them as good prospects. Then I can turn around and ask why this hasn't been done or make some other suggestions on how to close a sale. It makes the salesmen acutely aware of what's going on with each of their clients, since they know I'm on top of it."

In the weekly reports, the salespeople are asked to list each client's name, address, phone number, and type of business; the date when they first talked to the client and the date of their last conversation; the type of equipment the client has and what he wants; a short synopsis of what has been accomplished so far, and a projection of when a sale will occur.

Though he has been selling computers for six years, Mitchell did not use them in his sales department until last year. For those first five years, the salespeople kept their records on either 3-by-5 cards or in some other handwritten fashion. When he first introduced the computers, he used a sales program he wrote, but recently he switched to a program called Sales Planner, developed by National Microwave of Irvine, California.

"I used to ask for these things before we were computerized, but it was tough at best to get it," says Mitchell. "It either took up too much time from selling or else it didn't get done." Now, with the computers, all Mitchell's salespeople have to do is fill in the blank for each customer, a process which takes only a few minutes.

Tom Polatowski, vice-president of sales and marketing for Technology Assistance, a consulting firm which specializes in providing information to businesses with high technology needs, uses the same software as Mitchell to coordinate his national sales team.

With seven sales representatives scattered across the nation, Polatowski relies on regular reports from his salespeople to keep in touch with what's going on. Since each salesperson uses either an IBM Personal Computer or a Kaypro, Polatowski

has them send their reports on disks through the mail or transfer the information via modem.

For the first two years out of the three in which the company has been in business, the sales reports were handwritten and poorly organized. One of the benefits of the computer system, says Polatowski, is that it forces the salespeople to write a sales report that provides the same standard information for each customer.

When the reports were handwritten, Polatowski would get either an oversimplification or just a jumbled picture of what his sales staff was doing. Instead of getting a generalization, he now sees the sales representatives' working files.

"It's like when you're a kid and you play that game where you whisper a word into someone's ear and then he passes it onto the next person, and so on around the room," says Polatowski. "By the third or fourth person, the word has changed. That's the way it can be with sales reports. By the time it reaches the sales manager, it's not the same. But now I can look at the actual sales files."

As with Bearse and Mitchell, Polatowski will talk to his representatives about the amount of time they are spending with each client. With the computer reports in front of him, he is in a better position to tell the sales representatives if they are managing their time efficiently.

Help for the small business

While this type of information can help managers in large sales departments direct their salespeople towards specific clients, it can also help smaller companies identify their market. This is what happened to Karl Brown, a consultant in Carmel Valley, California.

Today, Brown specializes in providing software information to book publishers and fund-raising groups, but until several months ago he was less choosy, acting as a consultant to a variety of organizations and

individuals just looking for home computers.

The change came late last spring, when Brown began using Bisybase, a program developed by the San Rafael-based International Microcomputers Software Inc. (IMSI). Though he now uses the program mainly for administrative paperwork, letter-writing, and so forth, he has used it to analyze his market. By categorizing each client by their type of business, he was able to identify where he was making the most money, then redirect his sales effort.

"What this caused me to do was shift my attention away from the one-time business to the fund-raising groups and publishers," he says. Bisybase not only helped Brown identify where he was making the most money, but it also made him aware of another important consideration—the fund-raising groups and publishers were the best customers as far as paying their bills.

Reducing paperwork

While personal computers may help sales managers analyze the market, project sales, and better direct the salespeople, some users say the real beneficiaries are not the managers, but the salespeople themselves because of the administrative chores the computers handle. In this sense, not only do personal computers help bring salespeople in from the cold, but they also help them avoid such unwanted situations as cold calls. By providing a central location to store client information, as is done at Mitchell's store, a salesperson no longer has to search through a stack of 3-by-5 cards and several filing cabinets to find information. Instead, the information is at his fingertips.

This is beneficial as well to small businessmen such as Brown, who need to have these administrative chores completed without incurring considerable costs. Brown uses an Apple II Plus and an IBM Personal Computer to store general records,

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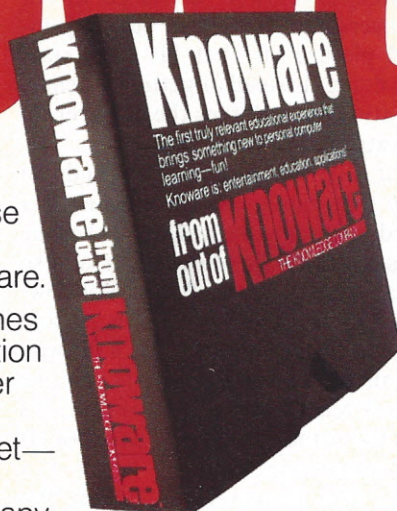
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CIRCLE 126

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Salespeople can use a software program to help them determine the most effective way of closing a deal.

CORPORATE/ BUSINESS

generate sales letters, and keep track of appointments with customers.

For someone like Polatowski, who is on the road for three months out of the year for Technology Assistance, the appointment calendar provides a needed service. Whenever Polatowski goes on a sales trip, his secretary prints out an itinerary beforehand which lists every person he needs to talk to each day and what they need to talk about.

Cradoc Bagshaw, a professional photographer based in Albuquerque, New Mexico, says he has improved his sales by using a computer program called MarketFax that comes with a large supply of prewritten business letters.

Bagshaw actually has three businesses. He is a photojournalist, an industrial photographer, and a supplier of stock photographs. While he might not be considered a salesman in a traditional sense, Bagshaw cannot survive without continuously selling himself. Yet because his assignments often take him out of state, he used to neglect communications—a shortcoming which often lost him business.

Taking the basic letters supplied in the MarketFax program, Bagshaw has customized them to fit his particular needs. He now has 100 different letters for 100 different situations stored within his Alspa personal computer.

Whenever he makes a new contact, he immediately mails out a letter to set up an appointment to show his portfolio. When the appointment is made, he sends out another letter confirming it. When he gets a tear sheet from an editor, he sends off a "thank you" note not only to the editor, but to the writer he worked with, as well. Previously, time limitations prevented him from sending such courtesy notes. At best, he would hastily scribble off a letter, if he sent one at all.

"It used to be that when I didn't hear from someone after a while, I would lose their business," says Bag-

shaw. "But now as long as I keep up a line of communication, the door remains open and I still get work."

Sales psychology software

Certainly, increasing sales is what it is all about for the sales staff. While most sales-oriented software is designed to either increase the salesperson's efficiency so he has more time to sell or improve the sales manager's ability to direct salespeople, there is one thing personal computers still do not do—convince the customer to buy the product. However, there is one unusual package available which, though it doesn't actually sell the product, does help the salesperson determine the most effective way to sell it.

Called Sales Edge, the program compares the psychological traits of the salesperson and prospect and then provides a report predicting how the two will interact. The report also tells the salesman what is the most effective way for him to manipulate the prospect into buying the product. It does all of this by first asking the salesperson to answer 80 yes-or-no questions about his personal likes and dislikes. It then asks him to agree or disagree to the use of 50 adjectives to describe the prospect.

Designed by Jim Johnson, a former clinical psychologist who now runs Human Edge Software Corp. in Palo Alto, Calif., the program has been used by Human Edge salespeople to help their sales efforts. In one instance, the company used the program to help close a deal with Richard Thalheimer, the owner of the upscale executive-oriented Sharper Image Catalogue. The two companies had been negotiating the terms for inclusion of the software in the catalogue when they came to an impasse, says Jim Chapman, vice-president of marketing for Human Edge.

What happened, says Chapman, is when Thalheimer saw the agreement worked out by his staff, he decided it


was too one-sided in favor of the software company. He wanted it renegotiated.

Human Edge officials then turned to Sales Edge to decide which salesperson would be most effective in working with Thalheimer to conclude the negotiations. Chapman, who at that point was the only salesperson to meet the owner of Sharper Image, entered the information on Thalheimer's personality into the computer, which was then compared to the personalities of Chapman, Johnson, and two other Human Edge employees. The match turned out to be Chapman, so he set up an interview.

"Thalheimer is a somewhat impulsive person. He is colorful," says Chapman. "In negotiations he can be tough-minded or single-minded. Our report said a confrontive approach would be the most effective."

When he met with Thalheimer, Chapman was confrontive. In the middle of the meeting, he gave Thalheimer the Sales Edge strategy report on him, something Chapman says he would not usually do, but in this case it seemed appropriate. Thalheimer was intrigued. He wanted others on his staff to enter their opinion of his personality into the computer. When their observations provided the same results, Thalheimer was impressed, says Chapman. Two hours after the meeting began, the deal was signed as it was originally negotiated.

Chapman compares Sales Edge to good strategy in a tennis game: The importance of both, he says, is they allow the players (or salespeople) to remain in control.

While the use of personal computers may not determine the outcome of a sales effort, their use may make the sales manager a better coach, while helping the salespeople out of the no-win situation in which they are so often trapped. The outcome will still depend on the salesperson's ability, but personal computers can provide the winning edge. 

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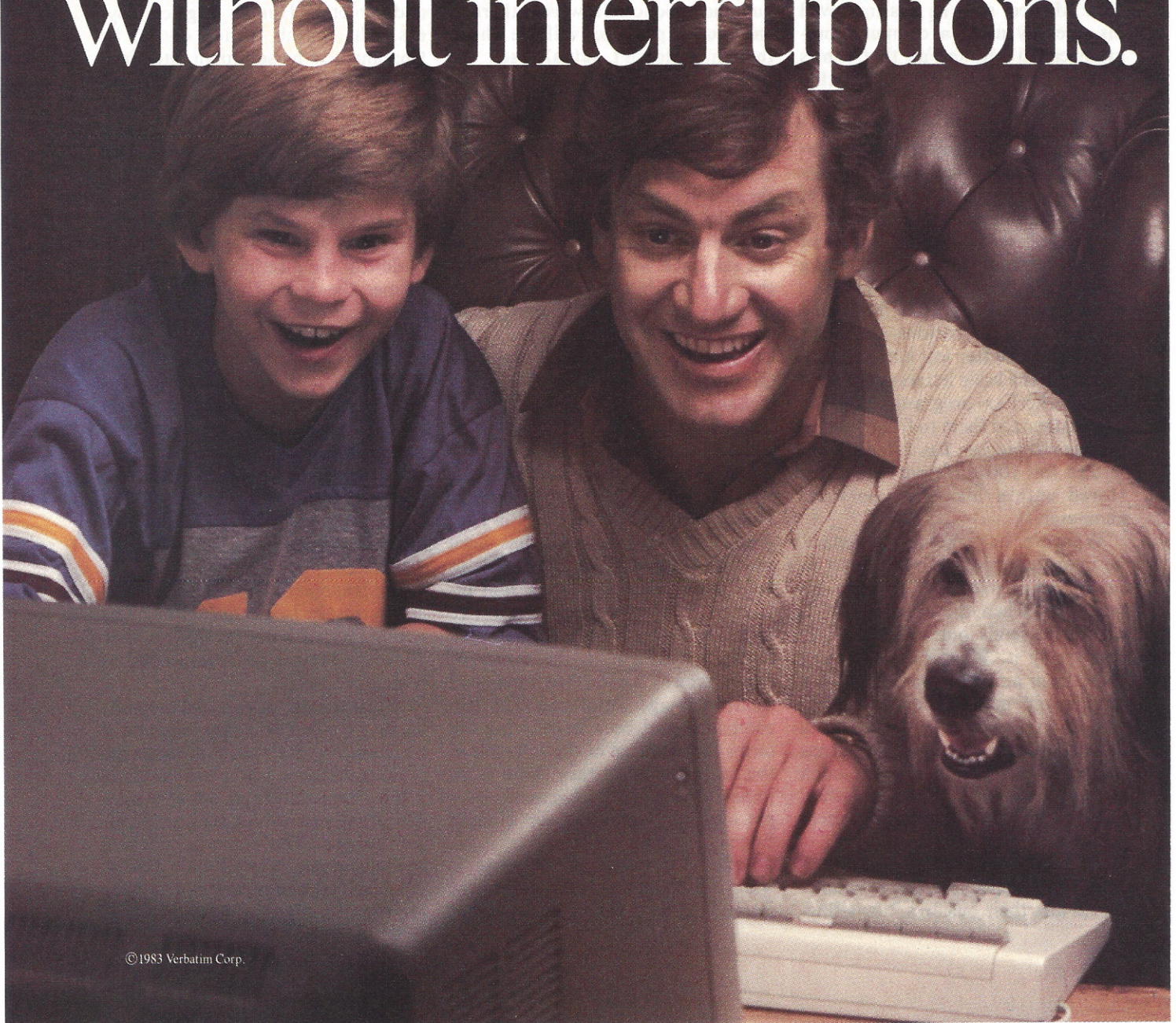
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CIRCLE 66

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When You Buy Another Computer

The big question is . . . should your new one be compatible with your old one?

by Paul Bonner, Senior Editor

Ah . . . another computer. The chance to double your pleasure, double your fun. Or to double your headaches if you're not careful, or you don't pay enough attention to what may, at first, seem like small details when you're deciding which computer to add to your stable.

There are, to be sure, plenty of reasons to buy a second computer. Maybe you've got one in the office and would rather buy another one for home use than truck your first one back and forth. Maybe your assistant has appropriated your first computer, increasing his productivity, no doubt, but leaving you with only a dim memory of the magic you accomplished when your fingers danced across the keyboard.

Maybe you feel that you've outgrown your first computer, that you want to buy another, faster, more powerful machine and give your first one to the kids, or to the church of your choice. Maybe you just can't resist this month's hot new machine: It's too much of a bargain, or too sexy, or too powerful, or too whatever to pass up. No matter what your reasons are, our surveys indicate that once you've had your first computer for a year or so, there's a good chance you'll consider purchasing another one to augment or replace your present system.

Having had a system for a while, you're certainly in much better shape

to make a sound decision when you purchase another computer. You can probably explain the difference between 48k of RAM and a modem, you know 101 things not to do with a floppy disk, and you've learned that the term parallel port refers to other things than the geographical location of Newark in relation to New York City. So buying another computer should be simple, right?

Well . . . not necessarily. Because of that old bugaboo of the computer world, compatibility, buying a second computer can involve some hard choices. It's akin to cooking a meal. Before you begin, you're limited only by what your cupboard holds. But once you've started off the main dish by sautéing a half-dozen cloves of garlic and a few dried chili peppers in peanut oil, you'd be well advised not to mix in the contents of a box of instant vanilla pudding mix, unless your object is to go hungry. The ingredients simply aren't compatible.

Just as the proliferation of recipes for abominations like Kung Pao Pudding led to a couple of generations of American men declaring that they were meat and potato eaters, so the incompatibility of the operating systems and software used by various computers has led to a lot of people declaring, "I'm an Apple user, period," or "I'm an IBM user, period," or "I'm a CP/M user, period," and so forth. If you're prepared to make that

kind of statement (and there's no reason why you shouldn't if you simply want to do more of what you're doing already), then the problems associated with buying a second computer are greatly reduced.

But if, on the other hand, the reason you're considering a second computer is that you want to do different things or run different software than your present system allows, or you want the things you're already doing to be faster or easier, then buying a different brand of computer might make a lot of sense. But it also means that you'll almost surely encounter compatibility problems—or rather, incompatibility problems—with your two computers and the software and peripherals they use. What are those problems, and how can you minimize them?

A tale of woe

Let's look at the case of R.B. (name withheld), a sharp young vice-president of finance for a fast-growing electronic communications firm. He began working with personal computers about three years ago, using the original VisiCalc on an Apple II Plus. At first, he was enthralled with these new tools, using VisiCalc for hours each day, and eagerly confessing to anyone who would listen that "I've wasted half my working life doing this stuff by hand." But soon he began to grow dissatisfied

with the program's performance on the Apple, and started buying every enhancement he could find.

By this time a year ago, he had added two memory boards and an 80-column board to his Apple. Each of those products required that he run a preboot program before booting VisiCalc in order to make VisiCalc recognize the enhanced display and memory capabilities available to it. And still he was dissatisfied, complaining that it took the program several minutes to load or save the huge models he had constructed, and that it took forever to recalculate a model.

That's when he first saw Lotus 1-2-3 running on an IBM Personal Computer. It took him about 30 seconds to realize that here was the answer to all his complaints about VisiCalc on the Apple. He ordered an IBM and a copy of Lotus that day, thinking his problems were solved. Little did he know that they had just begun.

Within weeks, the IBM and Lotus arrived, and R.B. set them up on his desk. And there they sat, virtually unused, for nearly a year, while R.B. continued to work with VisiCalc on his Apple.

Why? Because he had 40 or 50 floppy disks filled with VisiCalc models that he had put together over a two-year period. Thirty or so of those disks he used regularly (as in, he couldn't live without them). And while Lotus contains routines to import files created by the IBM version of VisiCalc, all it knows how to do with Apple disks is issue a "disk read error." Unable to use his VisiCalc files directly, and unwilling to take the time it would require to re-enter a hundred or so large VisiCalc models line-by-line in Lotus, R.B. had no alternative but to search for another solution.

The first solution that occurred to him was to use a hardwire connection between the serial ports on his Apple and his IBM to transfer the files from

the former to the latter, and then store them as if they were IBM VisiCalc files. It was a good idea, and there was someone on his staff who could write the necessary programs for both computers to read the files on the Apple end, send them out through the Apple's serial port, receive them on the IBM end, and store them on the IBM's disk.

Unfortunately, it didn't work. Lotus didn't recognize the files as VisiCalc files, and thus was unable to import them. In fact, even the IBM version of VisiCalc failed to recognize the files. The problem was due to a rather small, but crucial, difference in the way the Apple II and the IBM store files. While the Apple stores files with only a carriage return at the end of every line, the IBM stores both a carriage return and a line feed after every line. The staff member who wrote the transfer programs for R.B. didn't know that, and thus wrote the programs to perform an exact character-by-character exchange between the computers. The result, to programs running on the IBM, was garbage.

Defeated in his first attempt, but undeterred, R.B. turned to a software package designed to do essentially the same thing that the program the staff writer had written did, but that also added line feeds to carriage returns, and performed other clean-up tasks where necessary. It worked. Sort of. Unfortunately, it also took forever to transfer a single file from the Apple into a memory buffer it set up in the IBM. Doing a little quick calculation, R.B. realized that even if he figured out how to keep the program from crashing so often, it would take him about two weeks of constant effort to transfer the files he needed to the IBM. He didn't have that much time, so once again he withdrew from the battle for a while to attend to more urgent tasks.

Fear not, empathetic reader, for there is a happy ending to this tale. Finally, after about a year of inter-

mittent efforts, and for an incremental cost of only \$680, R.B. found a solution which allows him to transfer his files quickly and reliably. The key: the Quadlink board from Quadram (Norcross, Ga.), which is now shipped with a software utility called Quadcopy which allows his IBM to read a file from an Apple-formatted disk in one drive and then instantly write it back to an IBM-formatted disk in the other drive, or vice versa. (Early shipments of the Quadlink board did not include the Quadcopy utility.) He gives the file being written on the IBM disk a ".VC" suffix, and then uses the Lotus translate routine to translate the new file, which it recognizes as a VisiCalc file, into a Lotus worksheet file. And thus, R.B., who for a year shared his desk with two computers, can finally foresee the day when he'll be able to do all his work on the machine of his choice.

The facts of the matter

As illustrated by the saga of R.B., buying a second computer can open a frustrating can of worms. The software, data, and peripherals which you've been using daily on your first computer may appear to be totally inaccessible by your second computer. All R.B. wanted to do was transfer his data files from one machine to the other, and then be done with the first machine. If he had wanted to go on using his first machine, moving his data files back and forth at will, the problems would have been even more complex.

Nevertheless, there are solutions to all of these problems. They simply take a little planning, and the knowledge of where to look for help.

The first thing you should look at is software. If you've used a computer for a while, there's probably at least one program which has become second nature to you. The bad news is that if you make the move from one brand of computer to another, the disk containing that beloved program almost assuredly *won't* run on your

*That old bugaboo, compatibility,
can cause some hard choices in
buying a second computer.*

new computer. (CP/M machines with utility software allowing them to run and/or load several CP/M formats are the only common exceptions to this.)

Programs which are written in BASIC, and are not copy-protected, may be transferrable to your new machine with some effort on your part, by transferring them (as ASCII text files) through the serial ports on your two computers and then modifying them to reflect the new machine on which they are to run. Some file transfer programs, notably Apple To IBM FTP and TRS 80To IBM FTP from Personal Computer Products (Santa Monica, Calif.), even include utilities designed to ease the process of translating BASIC programs. In addition, the source code for programs written in "transportable" languages, such as Pascal or C, can also be transferred as text files between computers, provided that you have a Pascal or C compiler that will recompile the source code on your new machine, and that you remove or rewrite machine-specific references in the source code for the program being transferred. Again, as in the case of BASIC programs, this only applies to unprotected programs, which for all practical purposes usually means programs you've written yourself.

The good news about software is that many leading commercial programs are available for a wide variety of machines. Thus, although you'll have to plunk down the money for a new copy of your favorite program, you *may* be able to transfer your data files to your new machine and then use them on the version of the program written for that machine.

Assuming that the data files created by a program on your first computer are transferrable, and are stored in a way that another version of that program for your second computer can understand, how do you get them from one machine to another? The first, and perhaps the most commonly used method is to use a serial

transfer program. These programs are basically specialized communications programs. Normally they come on two disks—one for each of the computers they are designed to link. The correct program is booted on both machines, after the machines have been linked via either a modem or a hard-wire connection between their serial ports.

Most serial transfer programs can transfer virtually any ASCII text file or DIF file, and sometimes even binary or BASIC files, between machines, and they can perform any necessary translation in order to make the file useful on the new machine.

One of the more complete serial

transfer programs is The Apple-IBM Connection from Alpha Software Corporation (Burlington, Mass.) which allows the user to transfer files between an Apple II and an IBM Personal Computer, or between two Apples or two IBMs. A unique feature of the program is that although the Apple disk runs under Apple DOS 3.3, it has a utility called CPM-TODOS which converts Apple CP/M text files to Apple DOS. Once converted to DOS 3.3 files, your files can be transferred to an IBM or accessed by programs running under DOS 3.3.

The problem with serial transfer programs like The Apple-IBM Con-

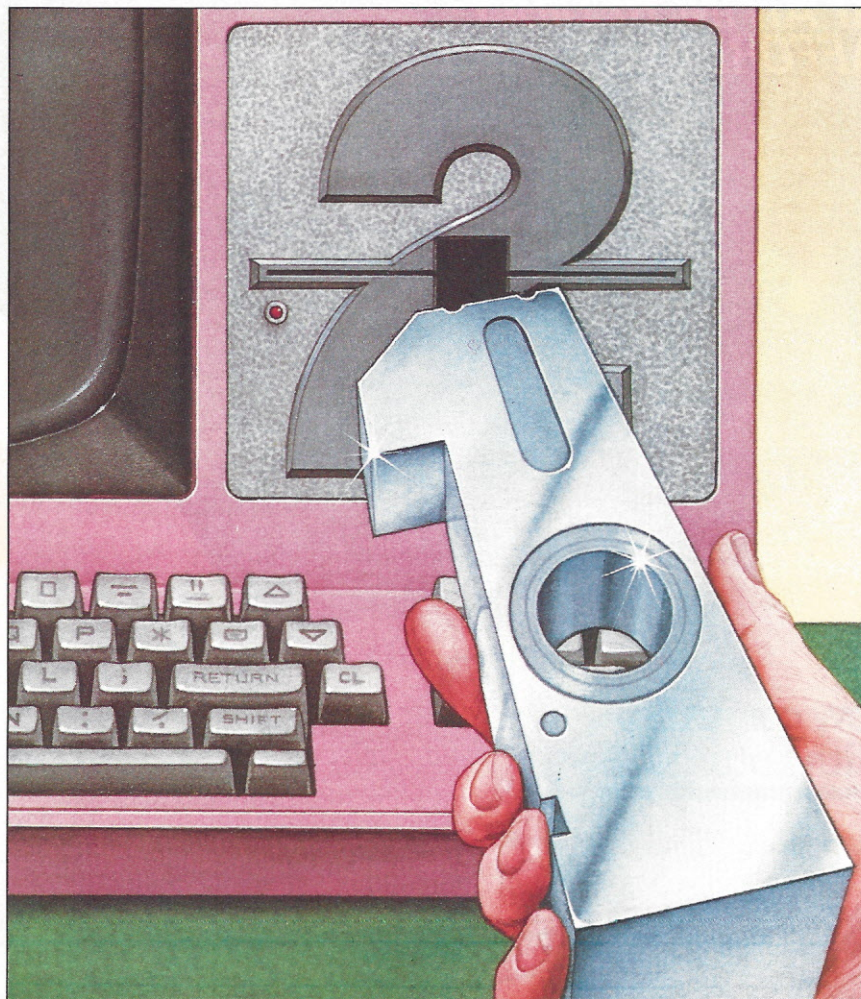


Illustration by Denis Orloff

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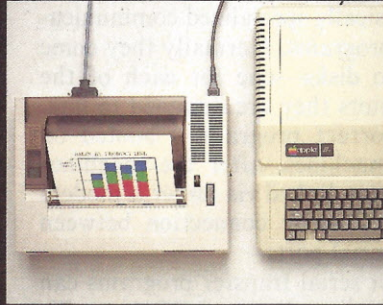
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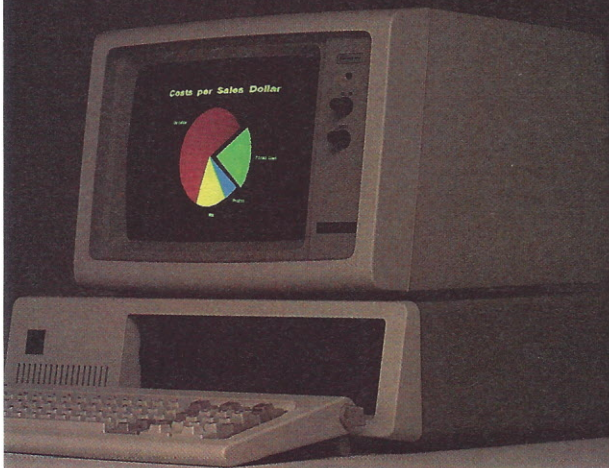


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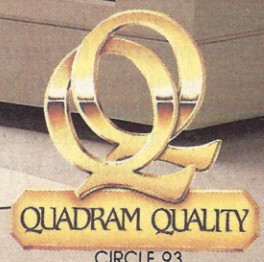
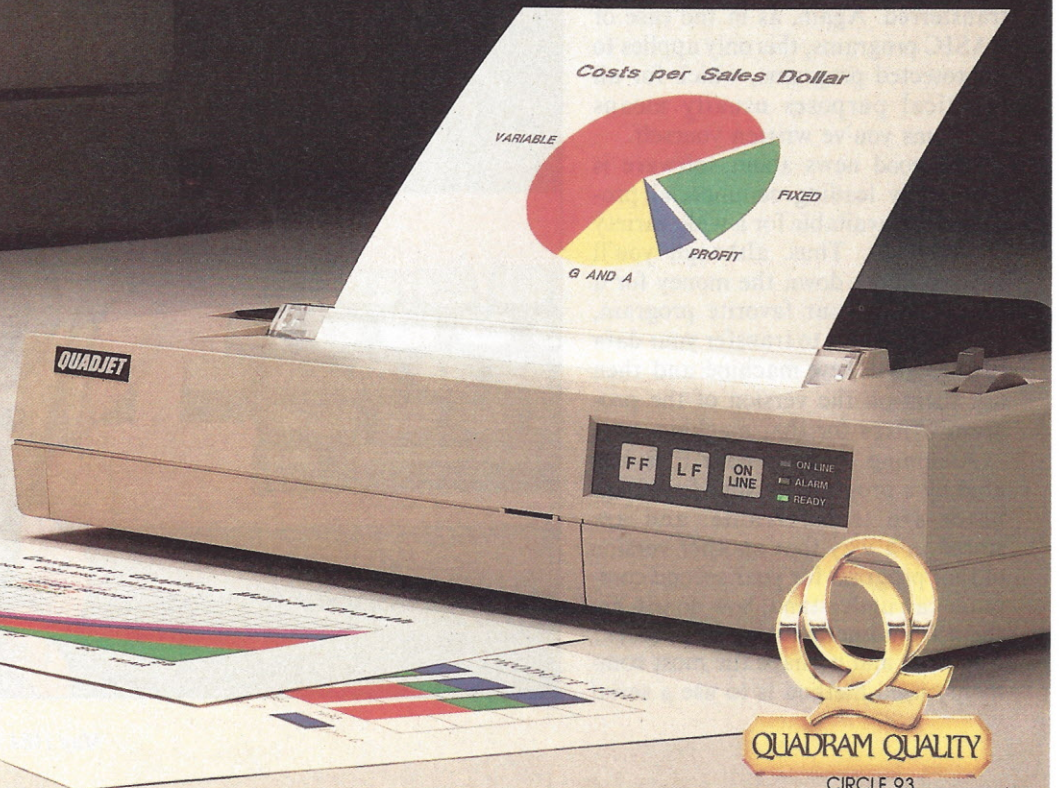
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Now compatible
with Lotus 1-2-3



Solutions to the compatibility problem involve planning and knowing where to look for help.

PERSONAL PRODUCTIVITY

nection or the Apple To IBM FTP or TRS-80 To IBM FTP from Personal Computer Products is that they're slow. Jerry Kaye, marketing director for Vertex Systems, (Los Angeles, Calif.), says, "For accurate serial transfers, most people are looking at (a speed of about) 1200 bps." When you want to transfer hundreds of thousands of *bytes* of information, 1200 *bits* per second turns out to be a snail's pace. It may be acceptable if you only want to transfer your data between machines once. But it will turn out to be infuriatingly slow if you want to transfer data regularly.

Kaye provides a good illustration of this: "You can imagine how insane it is to go through the rigamarole of serial file transfer every time you want to swap data from one machine to another. Let's say that someone is using a data base at home on a CP/M machine and he enters new customer information into a large file. If he goes back into the office and uses a serial transfer program to move a diskful of data over to his IBM, he has to sit there for two-and-a-half hours while the data gets transferred over. It's nuts."

Because the people at Vertex Systems were faced with that very problem, Kaye says, "We said, 'This (serial transfers) is a bunch of baloney. There's got to be another way.' So we did some research and talked to a bunch of programmers and came up with Xeno-Copy . . . a one-way file transfer that allows you to directly insert the disk of about 48 CP/M machines into the IBM Personal Computer. It will read the files and transfer them to a formatted PC-DOS disk. It moves the files from CP/M-80 or a variation thereof, TRS-DOS or TurboDOS or whatever, without actually affecting the files at all. You can think of it as a replacement for a serial file transfer. It eliminates all the hardware and runs over a hundred times faster. The equivalent baud rate would be about 100,000 bps. . . . About the only two

CP/M machines we can't support right now are Apple CP/M disks and Commodore disks.

"Of course," Kaye adds, "once you get the data in, the question is, how do you get it out? So we did some more development and came up with Xeno-Copy Plus." The latter program allows you to transfer files both ways between MS-DOS and PC-DOS.


In effect, Xeno-Copy and Xeno-Copy Plus perform the same function as Quadlink's Quadcopy. Running on the IBM Personal Computer, they read files written by one operating system (Apple DOS 3.3 and CP/M-80, respectively), and immediately write them back to a PC-DOS file (or vice versa.) The transfer is almost instantaneous, since it takes place entirely in RAM.

Other RAM transfer programs which operate by making the disk drives of your computer read disks in one format and then write them in another are Import! (also from Vertex Systems) for moving data into a DEC Rainbow from any of 26 single-sided CP/M formats, and Uniform (Micro Solutions, DeKalb, Ill.), for moving data between various CP/M-80 formats.

The final area that you have to consider in buying a second computer is that of peripherals. Whether this turns out to be a problem depends largely on how your initial system was set up. If your first system included an internal modem, or an internal printer, or an internal hard disk, you can pretty much kiss those babies good-bye. The only way to use them would be to transfer the data you wanted to modem, print, or store from your second computer to your first computer (assuming that you keep it) and then make use of the desired peripheral. That could get a bit tedious. However, if all your peripherals are external, stand-alone units, then as long as your new computer can output both serial and parallel data you'll be able to use your

old peripherals with your new computer right off the bat, or at most after buying a new interface card or a new cable or two. (It's at this point that the advantages of an external modem, hard disk, printer, etc., really become apparent.)

This may be starting to sound complex and expensive. Buying a second computer obviously involves more than simply buying a second computer. You have to buy new software, and perhaps new peripherals as well. Then, you have to learn how to use your new software, and a new operating system, and a new keyboard. Then you have to find a way to get your old data into your new computer. And even if you can use the simplest methods for doing so, something on the order of Quadcopy or Xeno-Copy, it's still going to be a more complex process than was accessing the data on your first computer—at least until you get it all transferred over to your new machine.

It would be nice if you could avoid all these hassles. But it may be that you can't. The reason for that is the same reason that you might consider supplementing or replacing your Kaypro with an IBM or your TRS-80 with a Macintosh or your whatever with a whatever in the first place: The market offers no perfect computer with the perfect software for all uses, and little if any compatibility between computers. And if you want a machine that's faster, more powerful, more portable, sexier, or more prestigious than your first computer, then it's a good idea to know exactly what's involved in making the switch to a different machine. Once you do, the central questions in buying a second computer are really no different from those you asked the first time around: What do you want to be able to do with your computer, what price (in terms of money and time) are you willing to pay for those functions, and, finally, what computer meets those criteria? 

Picking The Perfect Word Processor

Word processors offer an amazing range of features and capabilities. But how do you find the package that's right for you?

by Arielle Emmett, Contributing Editor

Writing is an act of thievery. No matter what you're writing about, you must intrude into an unknown subject and make sense of it. To do that, you gather research, recognize the audience for your writing, and sift through thoughts of how to "gain access" into the story or message to be conveyed. For some people, the process is like scaling the walls of a dark house. The object always is to find the right window, no matter on what level, and illuminate the house.

That is a role: to be a "reporter"—a thief of sorts. The object is to get in and get out with the story or message written down.

Word processors should never hinder that activity.

If they do, they are no help to you. That is the first rule of word processors. They ought to be an accomplice in your act of writing—no matter whether you're writing a straight business letter or a novel. As you struggle to form your thoughts,

they should give you a boost, not a kick, over the wall. The best ones then become entirely transparent—out of sight, out of mind—as you write your story or message on the computer, revising it until you are ready to get back out again, at which time the processor becomes a typesetter or cosmetician.

At this stage, the software stores your words, dividing them into different files and formats, if necessary; counting your lines, if you request it;



The first rule of word processing is that it should help, not hinder, your writing.

and telling your printer exactly how to rearrange the look of the words on the page to suit your intended market or audience. A message to Mother, for example, gets a simple package: a letter that looks like a simple letter. Bosses get an "integrated" report, featuring your words combined with financial information, bar charts, or lists off a data base. Technical publishers get a camera-ready manuscript complete with variable margins, perfectly aligned tables, and different type fonts to underscore separate sections. Depending on your role as a writer, and as a packager of your writing, you'll want and need different types of word processors to help accomplish your goals.

Complex choices

While the imperatives sound simple, the choices aren't. Today a \$2 billion word-processing industry has stampered the marketplace with over 200 products for personal computers—products promising "simplified human interface," "easy text editing," "fast, flexible formatting," "column

and block move," "multiwindowing capability," "proportional spacing," "word wrap," "dynamic page break," "hyphen-help" and "automatic disk buffering," among hundreds of other features.

As claims abound, so does confusion. A would-be purchaser is often assaulted by claims and dealer razzmatazz; "X or Z word processor is 'hot,'" the dealer says; "Look at the number of functions!" "What do the functions mean?" you ask. "I don't know!" is the reply. "Read the packaging cover—you'll find out soon enough!"

"Dealers want to convince buyers to get what they're pushing at the time," asserts Ernest Mau, an Aurora, Colorado-based free-lance writer who has used more than 85 word processors. "When someone comes in to buy a word processor, and the software comes bundled with a hardware system, it may be too powerful for his needs," Mau observes.

By far the most disturbing aspect of the industry has been its focus on word processors as mechanistic de-

vices, i.e., the English language equivalent to food processors—with little worry lost on the fact that most people do not write well. While some word processors have attempted to address the problem—especially those featuring add-on thesauruses, spelling and grammar checkers, split-screens (for comparing drafts), and systems for outlining, the majority are still designed as "electronic vacuums," of sorts—the modern-day blank tablet on which to write. Users must not only master the intricacies of the program, but they must also face that screen, just as they once faced a blank piece of paper.

While this may seem an obvious fact to the initiated, it is probably not apparent to everyone. The overwhelming emphasis, even in computer publications, has been to divert attention away from the writing act and toward some romanticized view of "word processing." Rather than focusing on how well a program fulfills the writing, editing, cut-and-paste, and finished product needs of the individual, many software reviewers



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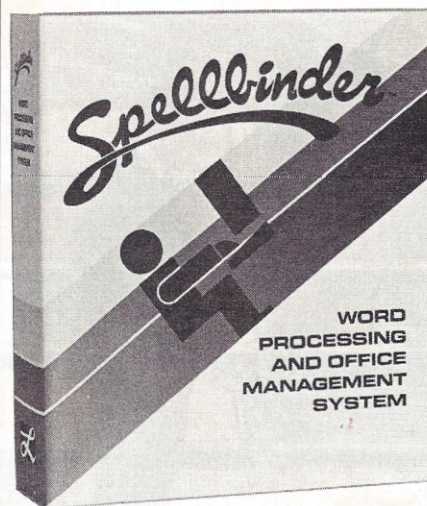
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High-end competition has increased package functionality and decreased price.

PERSONAL PRODUCTIVITY

have adopted the most opaque and intimidating computerese. Writing is no longer writing but "text entry." Parts of the software that rearrange the lines and space on the page are now "format processors." These are augmented by "automatic repaginators," "functional rights justifiers," and "form gens." There is so little consciousness of how machine language has crept into ordinary vocabulary that writers who write about computers can't break out of it. As a result, the readers, dear reader, are confused.

I don't wish to kid you about word processors. They are entirely useful and respectable as long as they help, rather than hinder, the writing process. Indeed, some programs have already emerged as excellent tools for writing; some are excellent for packaging your writing. Some do both reasonably well. Still others offer add-ons to help you write, spell, and outline your thoughts better than you did before. Much depends on your role in life—what you want out of a word processor, and what you can do without. Much depends on whether you really need a word processor. If you do any kind of writing, from the briefest memo, to long, complicated reports, you could use one. However, if you aren't somehow involved in the creation, or the polishing, of written words, then you probably don't need one.

If you're a businessman, choosing a package for yourself or others, the choice no longer boils down to "to WordStar or not to WordStar," although there are reasons why this package has risen to number one in sales over the world, with 800,000 packages already sold, according to MicroPro, its manufacturer.

One clear advantage of WordStar (\$495, \$895 with add-on packages) has been that it was first—in 1979—to offer personal computer users a real power pack of functions: ways to write, edit, and complete a polished, professional-looking document.

Learning wasn't easy—the program contains multiple levels and some 130 commands, most of which are predicated on mastering keystroke combinations involving the control key and a letter to execute cursor movement, scrolling, deleting, moving of copy, and so on. WordStar, though, proved itself by quickly expanding its range of capabilities—for example, by letting users read and merge data base files into a writing file, not only MicroPro's own, but others as well. "That's the biggest plus for business," says Maude Ackerman, a computer teacher and director of Entech (Commack, N.Y.), a computer training ground for business. "It accepts an awful lot of software through the Mailmerge function." Adds Kathie Krohn, a training manager for Raish Enterprises, Inc., a software systems house in Levittown, N.Y., "WordStar is the one that integrates with other programs. We have clients that have data base systems. Even with a word-processing function, you've got to be able to work with that data."

Staunch competitors

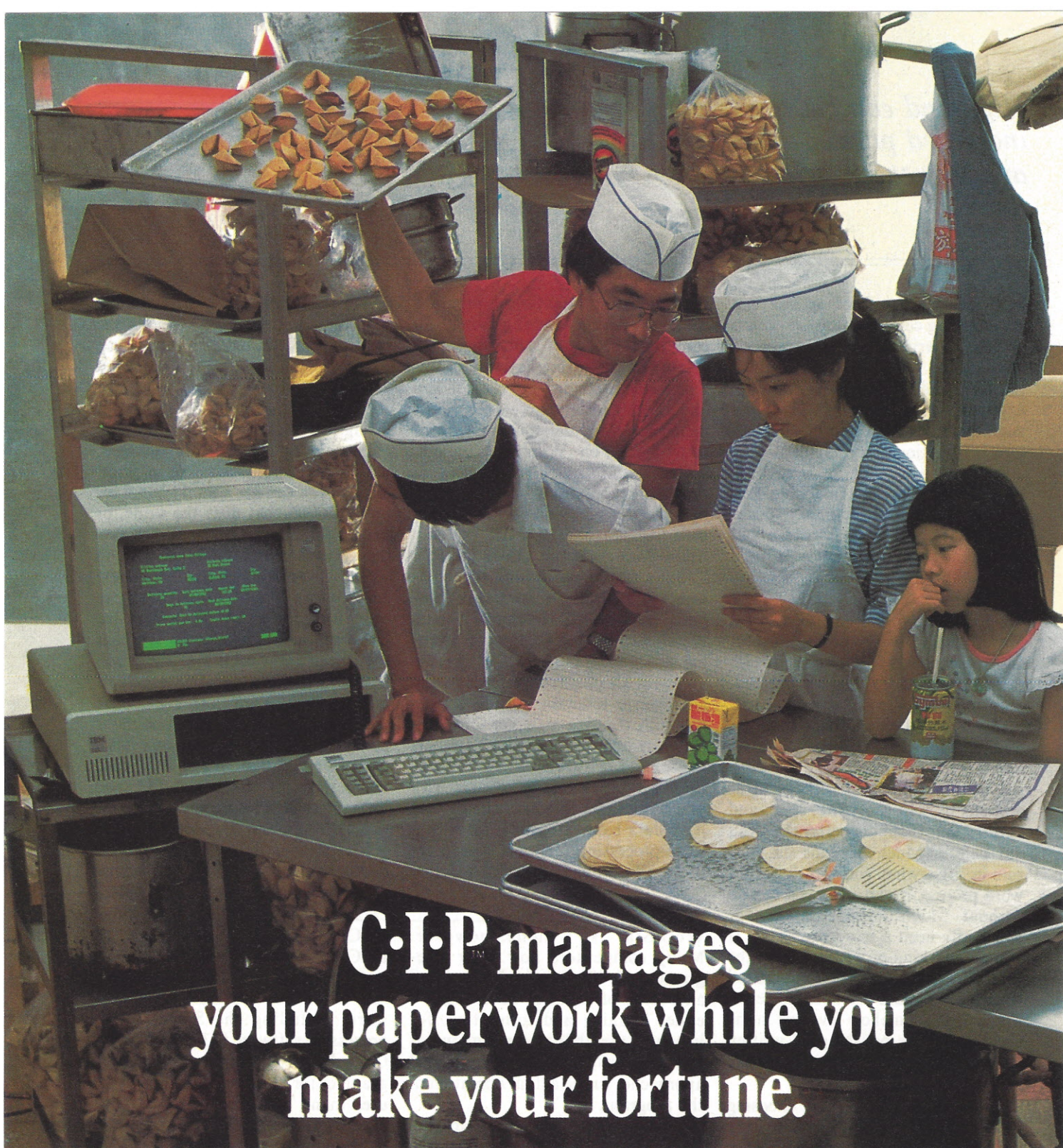
WordStar isn't alone, however. Many competitors now offer integrated and "file-reading" functions, and some offer other advantages—easier learning and formatting, for instance, the ability to merge words and graphics, as well as simplified approaches to the actual operation of the program.

On the high, IBM-end, Microsoft's Word (\$475), featuring a simplified point-and-click operation through the mouse, multiple windows on the screen, and customized style sheets, has captured the interest of business, according to Entech's Ackerman. It has a simplified method of operation (through the mouse) but does not yet have mail-merging capabilities. Another package, MultiMate, (Soft-Word Systems, Inc., \$495), has also won wide acceptance because it is designed to act like a "dedicated" word processor—a spin-off of the Wang, in

which IBM function keys combined with ALT and shift keys handle the bulk of the editing and formatting functions instead of a dedicated keyboard.

Whatever the approach, one result of high-end competition has been an increase in functionality of packages, with a concurrent decrease in price. "Today you can get a total system for under \$6000 that does the same, or better, than dedicated word-processing systems did for \$14,000 back in 1978," says Raish's Krohn. Some consultants would drop the price even further: to \$4000 or less for hardware and software. So stiff has the competition been that the traditional word-processing leaders, among them Wang and NBI, have created their own spin-off products for personal computers. Wang now has a processor package, Wang PC Word Processing, for the Wang PC, and NBI offers NBI Word Processing for the IBM Personal Computer and XT as well as its own OASys 4000 dedicated word-processing system. Another strong competitor, DEC, creator of the dedicated systems DECmate I and II, now offers the DEC Rainbow 100 and 100+ personal business computers, which will run MS-DOS and DECmate software, including the Select word-processing software (\$395). Observes Gary Heger, corporate director of graphics for Hayden Publishing, who uses many of these systems: "Your choices of product are totally dependent on how serious you are about word processing: It depends on how many bells and whistles you need to go off."

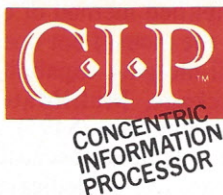
The choice is also contingent on how willing a person is to trade convenience for power, Heger says: Dedicated systems, for example, like the Wang OIS, are easy to use; the function keys are designed for word processing only. But a personal computer user can also get a good deal of power with a comparatively cheap word-processing package. "They are



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The chief source of a word processor's power is its editing capability.

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just more difficult to use than a dedicated system," Heger asserts.

With or without bells and whistles, today's word processors for personal computers do offer a startling range of capabilities. Basic systems like Radio Shack's Color Scribes (\$34.95, for the Color Computer), Quick Brown Fox (\$69.95, for the Commodore 64 and VIC 20), and Bank Street Writer (\$69.95, Broderbund Software, for Apples and Ataris) have made the basic writing and editing functions affordable and given thousands of children the opportunity to practice their writing on a computer.

In the manager's environment, where effectiveness is equated with easy shifting from one computing application to another, the so-called "integrated" or second-generation word processors have stolen the scene. Among these packages are VisiOn Word (Visicorp, \$375), an applications program in the VisiOn environment, the new Symphony (the successor to Lotus 1-2-3, Lotus Development Corporation, \$695), and MacWrite (Apple Computer Inc., \$195, with MacPaint, an integrated graphics capability), which works on the new Macintosh or the Lisa.

Sandwiched between the expensive, the cheap, and the integrated are the capable stalwarts, many of them offering efficiency and reasonable price: PFS/WRITE (Software Publishing Corp., \$125 for Apples, \$140 for the IBM Personal Computer), Volkswriter (Lifetree Software, \$195), Pie:Writer (Hayden, \$149.95 for Apples and \$199 for IBM), AppleWriter II (Apple Computer, Inc. \$195), among dozens and dozens of others. And there are packages that consultants consistently point to as excellent and unusual: among them WordPerfect (Satellite Software, \$495) for the IBM, which features excellent and various formatting capabilities (the ability to tell the printer how to arrange words on the page); The EinsteinWriter (Einstein

Corp., \$300) and The EinsteinLetter series (prices vary), which offer the user a split-screen capability, as well as a series of "model letters" designed to help improve writing ability. There are also spelling, proofreading, and grammar checkers: add-on packages that read word processing files. (For full listing, see April, *Personal Software*, page 130.) One package, The Idea Processor (\$295, for the IBM Personal Computer, Idea Ware), helps a writer create reference cards and outlines of his ideas before going into the actual writing. Still another package, Zardax (\$210, for the Apple II series, from Action-Research Northwest), creates finished, and "formatted" ASCII text files to transmit over electronic networks. The list goes on and on...

Roles and models

How does one make sense of it all? The first and most important step—after you determine whether you need a word processor—is to determine exactly what you do when you write. By analyzing your writing process—from first idea to finished draft and final copy—you should be able to create a personal inventory of ideas, and from there, go to a dealer and road test a variety of packages that may fit the bill.

Obviously, you don't need to be a novelist or reporter to make good use of a word processor. But you should determine exactly how much you write, and the types of writing you do. Are your activities limited to letter-writing, memo-writing, short messages sent through electronic mail, or writing down and polishing what other people have said or written? The simplest word processing can often be accomplished with mini text-editors built into the best E-mail and communications packages. Some computers, like the IBM Personal Computer, offer crude writing capabilities through their operating system; for example, you can access a "batch file" known as ED.LIN

(called up on the IBM directory); this gives you a clean screen to write on and allows you to write basic messages and do line editing.

Are you a secretary with heavy typing responsibilities? Do you need to type thousands of letters, or produce quality reports for clients? Or, are you a top executive who typically thinks on his feet, dashing off memos simply by dictating them to a secretary? If you're the latter, then think twice. Chances are you don't need a word processor, or a high powered one, at any rate.

Your secretary, though, may need a power processor—a "can do anything" processor which is especially strong in its output and cosmetic capabilities: from merging files and sorting lists to moving columns of print and generating customized forms. As a solution, you may consider a dedicated word processor—Wang, DEC, Lanier, and NBI are the names in dedicated systems, or you may opt for powerful word processors designed to work on personal computers. One solution—if you decide to get involved in the writing process—is to find a system that complements your need to compose brief drafts, or rough memos, and your secretary's more extensive, "finished format" requirements. WordPerfect, for example, now has an executive partner called Personal WordPerfect (\$95), which offers the executive a simple way to write without the sorting, merging, or spelling-checker capabilities of the more expensive WordPerfect. The files, however, are compatible, which is a great convenience. Alternatively, you could select a powerful package, like WordStar, on the assumption that someone in your office will eventually need all its capabilities. You and your secretary could start by mastering the lower levels of the processor, and work through to the more advanced levels as time and needs dictate.

Whichever option you consider, though, be forewarned: "There does

“... there's greater freedom to practice creativity as a result of the word processor.”

not exist a perfect word processor for all applications and all situations,” declares Ernest Mau, the free-lance writer. “The best anyone can hope for is a compromise,” he says, “or even to stock two, three, or a dozen word processors” to meet one’s differing needs in writing.

“There’s a big difference between book writers, technical writers, and letter writers. Business reports are in another world by themselves,” Mau continues, “the problem being that the user must determine what the bulk of his or her writing style will be.” Letter writing and short reports are generally simplistic. They don’t require a great deal of word-processing power. The manuscript writer generally needs an intermediate-level word processor—a what-you-see (on the screen)-is-what-you-get (on the printout) processor where the screen shows exactly what’s going to be on the printed page. But probably the most complex word-processing requirements are used by the hard-core technical writers, particularly those operating in a dynamic environment, like consulting and multiproduct-line companies. The problem they generally face is that formatting requirements change very quickly and very radically. “At one point, for example, I was working with 15 companies as a consultant doing technical manuals. Each one had a totally different requirement for format,” says Mau.

In those cases, Mau reports, he needed not only a what-you-see-is-what-you-get processor, but also one that allowed him the flexibility to “defeat the normal formatting provisions of the processor.

“A case in point,” he continues. “PFS:WRITE, a very nice processor for preparing letters, shows everything on screen as it will print on the printed page; but the processor will not allow you to exceed 80 columns in width as you write. You get a technical manual; most of my clients required elite type, 12-pitch type, and on-screen I had to go as much as 92

columns wide. This couldn’t be done with PFS:WRITE. It becomes even worse when somebody has to prepare a piece of tabular information. Sometimes those run to 130 columns. So PFS:WRITE with its prefixed format—or any word processor with a ‘line wrap’ (words reach an end point on the screen where they automatically jump down to the left hand margin of the next line) would prove almost impossible to use. You wound up with something like WordStar that allows you to horizontally scroll the screen.”

Completely adept at word processing functions, Mau is not terribly impressed with most processors.

“Word processors are typewriters with delusions of grandeur,” he continues wryly. “Basically you could accomplish the same things you could accomplish with a typewriter, but faster and easier. In actuality, the advantage of a word processor comes into effect after writing a particular work. I’ve yet to see a word processor that makes it easier to do the original entry. Typically, it takes me as long to type an article on a word processor as a typewriter. However, incorporating changes of any kind—there the word processor helps.”

Its *editing* capabilities, then, according to Mau, give the word processor its chief source of power. Deleting or moving words, lines, sentences, and paragraphs, easily, from one part of the electronic manuscript to another; “searching and replacing,” which enables the software to ferret out any word in a manuscript and substitute another: These are capabilities most writers would never have dreamed of several years ago. In addition to these, Mau cites “pre-programmed keys” or “macros” as being especially useful to people who write. These are single-keystroke or limited-keystroke combinations which can be predefined and used by the writer to repeatedly insert terms or entire phrases into the text. This is a time-speeding function when

phrases or titles are repeated often, especially in technical or legal manuscripts. Word processors geared toward the writer, he adds, ought to be able to read and merge text from other files (“I can tell the word processor, ‘read this file in.’”), a capability Mau identifies as “cut and paste” or “boiler plating.”

“These things speed fixing an article—the second passes through an article,” Mau observes. “From a writer’s point of view, what I’m finding is that there’s greater freedom to practice creativity as a result of using the word processor. . . . A lot of writers, when they’re getting down to due dates, begin to look at changes (they want to make). But they’re reluctant to look at them because of the amount of retyping required. With a word processor, it’s only a matter of a few minutes or hours to change a whole manuscript.” That makes it easier for the writer to do the hardest part of writing: getting the words right, revising, shaping the manuscript’s entire form.

But notice: Mau has made some definite assumptions here. The first and most obvious one is point of view. As a writer, first, he’s examined his role and process of writing, and from there, has stipulated exactly what he wants and likes in a word processor. That’s the most productive way of going about it—examining the self, the “who am I in relation to the tool?” question. The executive, by contrast, might not care at all about complicated formatting requirements. He has a secretary to do that; for himself, he might need a “quick-and-dirty” word processing program designed to let him write and edit rough drafts of his memos. But the evaluation process works the same: The self comes first, the product, after. Too often the examination works the other way around.

The second assumption Mau makes, though, is more subtle. He’s talked about features pertaining to text entry—i.e., the process of cre-

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*The word processing world can
be divided according to the roles
of writer, manager, and secretary.*

ating words on the computer. For Mau, that is the first part of the writing process: the input part. To him, word processing roles and functions are really divided into two parts: input and output. A writer, for example, creating a manuscript with a word processor has to be concerned about fluidity: easy and automatic commands, continuous writing, uninterrupted editing. Processors that excel in these functions, running with the writer as he or she creates, are *input* processors, according to Mau. "Input processors allow you to (enter your writing) in 15 minutes, but you don't have a lot of flexibility in telling the printer what to do." Whether you use function or control keys is immaterial, the main thing is that the keys should not slow down the writing process.

So-called output processors, by contrast, require more complex entry procedures and codes to do text entry (note that I don't say "writing"); "but they're designed to achieve anything you want on a printout." The classic "output" word processors, according to Mau, include Micropro's WordStar, WordPerfect, and Sierra On-Line's ScreenWriter (\$129, including dictionary). Input word processors are those with "maximum" friendliness toward the writer, like PFS:WRITE. "With PFS:WRITE, you plug it in, fire it up and you're ready to type," Mau says.

Of course, the best word processors will attempt to offer elements of both. But no doubt a technical writer or secretary will benefit from word processors that are primarily "output" devices, since the finished format of the document, after all, is the main goal, while an "input" processor may be just right for an executive, home correspondent, or manager whose main idea is to get the ideas down quickly.

Writer, manager, secretary

One woman who has also given some thoughtful examination to roles and

compromises in word processors is Ronni Marshak, associate editor of *The Siebold Report on Office Systems* and *The Siebold Report on Professional Computing*. Marshak is a perfectionist: She is writing a book on word processing and has even gone so far as to time the speed of various packages to compare functions. One shocker: A \$49.95 what-you-see-is-what-you-get package for the IBM Personal Computer, Bruce & James's WordVision, took less than two seconds to call up its directory; the \$495 MultiMate took 16 seconds. Similarly, WordVision took two seconds to copy a paragraph; MultiMate again took 16. Admittedly, MultiMate has many powerful functions WordVision does not, but, as Marshak observes: "Speed is under-rated in word processors, and when they are slow, productivity is lost."

Marshak's sense of detail carries over to her examination of other word processing functions. To her, the world of processors is not so much divided by input and output as by the classic "roles" they fulfill. These are the roles of writer, secretary, and manager. Not that people fit neatly into these categories, necessarily, but word processing packages do tend to emphasize one "role" over another.

The writer, for example, requires one basic thing: fluidity of writing (She and Mau agree on this point). Whether or not the material is "creative" isn't important. What is important, according to Marshak, are features allowing for easy text entry, text moving, printing, and "entering or editing text without going into different modes."

Marshak believes that the most crucial word processing feature for writers is "interactive insert," in her terms. What this means, simply, is the ability to edit while inserting parts of text. A writer should be able to strike over text in an "overwrite" command, or choose an insert mode, moving wherever he or she pleases on the page. "Many word processing

packages don't offer interactive insert mode," she says. (She cites MultiMate, Wang, and Samna Word II from Samna Corporation.) "You have to go into insert mode, then insert your material before you can edit that material or move the cursor to another part of the page. That's the way word processing systems traditionally worked."

Marshak is not in favor of complex formatting commands for writers: She deplores packages requiring "dot commands," for instance, inserted within the body of the text to tell the printer what to do; instead, she argues that writers ought to have simplified format packages, handled through function keys, which enable writers to see on the screen exactly how the page will look in print.

Secretaries, on the other hand, "may need the best of everything" on a word processor "because word processing is a secretarial function. Easy editing is very important, although it's not as vital to edit when entering the material as it is for the writer." In addition, merging files, sorting lists, and using the software to do customized page formats will be vital; a secretary may need to create documents with multiple ruler lines, different tabs, margins, line heights, spaces between letters, and line spacing per document. Only a power processor—an output-oriented processor—can accomplish those tasks.

Managers are a different kettle of fish. Unlike "top echelon" executives who do not write much themselves ("Top executives *dictate*," she says, with irony.), managers tend to be report-producers. For them, "easy access among files is necessary—documents from files like spreadsheets and data bases, imported and exported easily." Whether it's a memo or annotating a spreadsheet or a graph, managers can benefit from split-screen or windowing capability to compare materials. They also need easy and transparent text editing,

(continued on page 165)

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CIRCLE 71

Relational Data Bases That Take On The "Big" Jobs

High-end data bases give you power and flexibility
for better information management

by Elliot King

If you're like most people who have a job to do, you look for the best way to get the job done—a way that is fast and accurate. A way that lets you get the information you need, when you need it. This is the premise behind data base management—a rather sophisticated system of information record-keeping, but don't let the name fool you. Data bases don't have to be hard to use; they can provide you with easy access to and speedy retrieval of anything you want to put into it—client names, inventory, addresses, invoices, sales information—any information you need.

If your needs are simple—say, for example, you just want a program which you can use to enter and retrieve information—then a file manager should suit your needs. File managers include programs like PFS:File, Friday!, and Perfect Filer, which are often called low-end data base management systems. These programs operate like electronic file boxes filled with 3-by-5 cards. You can enter information on the cards, and, upon command, retrieve the information you need.

A growing number of users, however, not only want to retrieve the information, but they want to be able to relate it to similar information and manipulate it in various ways. This is

what a relational data base is designed to do. Relational data bases are more than simple file managers in that they offer users the ability to compare information in one file with information in another file by—as the name implies—"relating" the two (or more) bits of information through one common item, or field, as it's called in data base language. Though perhaps more complex and more difficult to use than a lot of preprogrammed business software, high-end relational data base management systems are being used throughout the business world because of the power they provide.

Adam Green, author of the *dBASE II User's Guide*, explains that with a relational data base, any number of items of information "can be connected if they have something in common."

To illustrate, Green gives the example of a library attempting to keep track of its patrons and the books they take out. The obvious solution is to set up a file which has the person's name, address, library card number, and three spaces, or fields, for books. When a patron checks out a book, that book is entered in the proper field and when she returns the book, the book is deleted. "But," Green points out, "if you have allowed three fields for books while patrons, on the average, check out one book, a lot of space in the computer's memory has

been wasted. And what happens if a patron wants to check out four books? Many systems won't allow you to add the extra field.

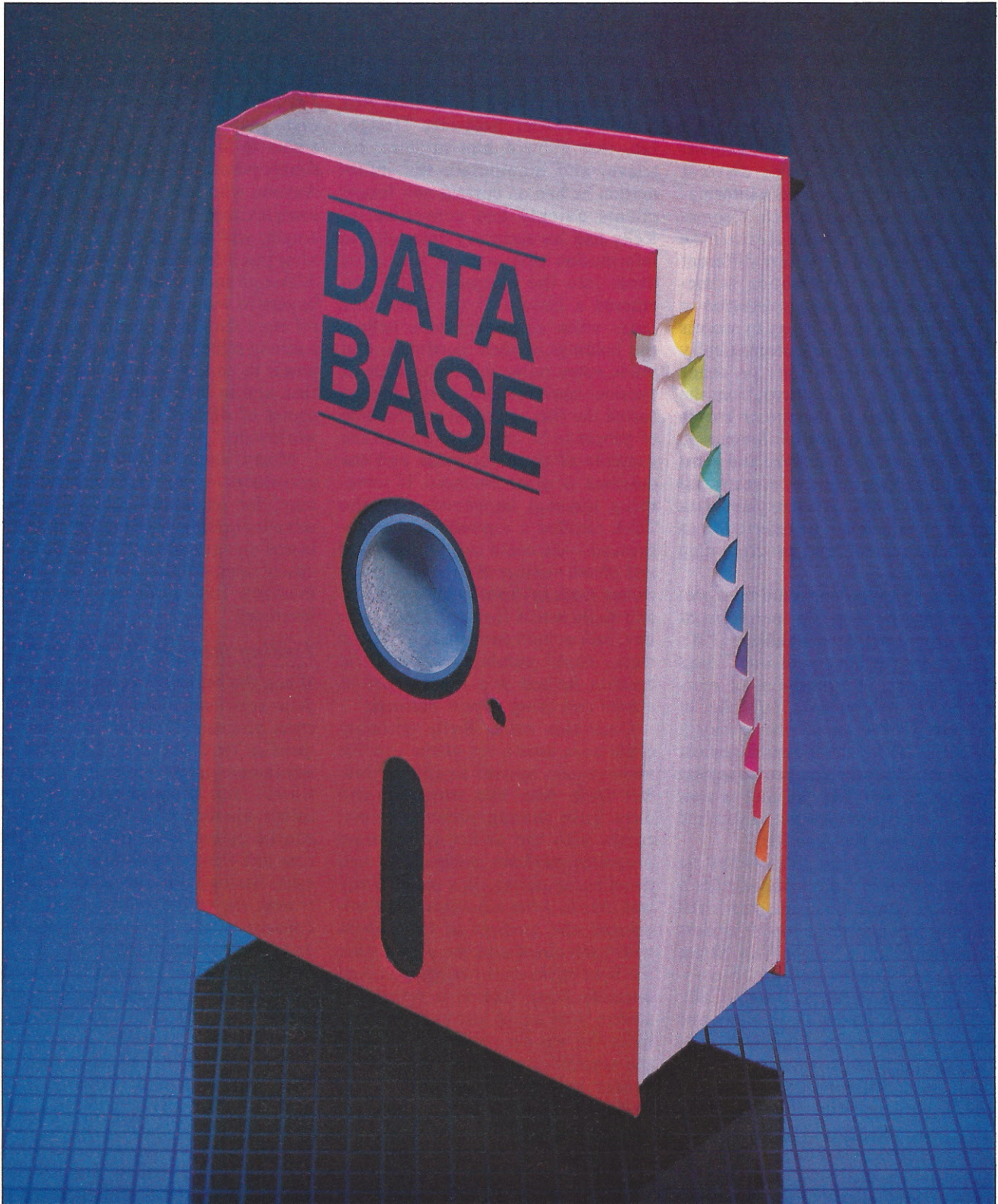
"In a relational system," Green continues, "you can set up two separate files or tables. In one, you just keep track of the patrons' names, addresses, and library card numbers. In other words, your first patron becomes record number one of that file, and the fields in each record are name, address, and library card number. You add more records as more patrons enroll. In the other file, each record has two fields: the patrons' library card number and the title of a book they checked out.

"As more books are checked out you keep adding records to the second file," Green says. "There is no wasted space and no limit on the number of books somebody can check out."

The ability to join the two files means you can determine which people in San Francisco checked out a certain book, for example, and Green explains how. In a relational data base system, he says, the program will see which library patrons in file one live in San Francisco, and remember the library card numbers of those people. Then it will identify which of those library card numbers in the second file matches up with the title of the book in question. "The two files are related through the library card number," he concludes.

Elliot King is a California-based free-lance writer.

*A relational data base
incorporates file management
and programming capabilities.*



Diorama by James Nazz. Photograph by Walter Chrynowski

The concept of relational data bases, as explained here, sounds simple enough—but in order to better understand and evaluate the power behind the relational data base, it may help you to know that a relational data base management system consists of three distinct parts: a way to structure the information as it is entered, which is sometimes called a *data definition language*; a way to retrieve different subsets of that information, sometimes called the *data interrogation or query language*; and a way to process the information by automatically performing calculations or other tasks on a set of data drawn from the data base. This is sometimes known as the *data manipulation language*.

It's important to analyze and compare all three aspects of a relational data base system: data entry and data retrieval, which can be referred to as file management, and programming capabilities.

Because a relational data base program incorporates file management and programming capabilities, "It's almost two products in one," says Rod Turner, vice-president of marketing for Ashton-Tate, publisher of dBASE II. "A lot of people buy it (dBASE II) for the file management and then discover the programming language. It's like buying a new car . . . every time you get in you find a new feature that you like."

One person who liked what he found is James Kelly, who credits a high-end data base system with making him one of the top 50 brokers nationwide for a large Wall Street brokerage house. Before he computerized the Newport Beach, Calif. office he ran for his firm, Kelly and the two brokers he employed used 3-by-5 filing cards to track between 2500 and 5000 prospects. White cards with potential clients' names, addresses, phone numbers, and interests were stacked everywhere—on desks, tables, chairs, filing cabinets—in any and every open space. As

a result, Kelly contacted some prospects too often, some not at all.

Kelly found his salvation in a personal computer and a data base management system called Data Ace from Computer Software Design, Inc. that allowed him to store, retrieve, and manipulate the information he had on current and future clients quickly and conveniently. Kelly had his secretary enter all the information that was on the index cards into the computer. She also entered a history of the times and dates when customers were called, the holdings in their portfolios, and made notes reflecting the essence of previous conversations. Every day she sorted the files to produce a schedule of people to be called that listed the contents of their portfolios and the outcome of prior contacts. If something unusual happened—say the FDA recalled a top-selling pharmaceutical—she could call up the name and phone number of each client who owned stock in the affected company, and Kelly would then poll them for a buy, sell, or hold decision before their losses could escalate. These little touches helped win the respect of clients and bring in new business.

Until this point, Kelly probably could have used a top-of-the-line file management system to fill the bill. But Data Ace, like most high-end data base management systems, comes with the ability to generate programs, perform calculations, and do ad hoc inquiries. As a result, Kelly was able to write a program that calculated the amount of time spent with each client and the commission per hour spent on the telephone. And because Data Ace is a relational system with an ad hoc inquiry capability, he was even able to determine the amount of commission per client versus how the first contact was made, in order to pursue the most lucrative methods of contact.

The key is that unlike many other types of personal computer software, high-end data base management

systems are designed to be flexible—to the point where they can be customized by the user through the use of a built-in programming language. This does not mean, however, that the uninitiated user can create to his heart's content after a simple perusal of the documentation. Anyone who has struggled with the complexities of WordStar, for example, will marvel at its simplicity after just a few hours with dBASE II. Although such complexity may cause buyers to wonder if they have bitten off more than they can chew, it is also a strong selling point. There's a lot of power to be had with a program like this, and in fact, more than 200,000 copies of dBASE II have been sold worldwide.

Many users who are not programmers—your typical businessman, for example—cope with this mixed blessing by finding a freelance programmer to prepare a customized application such as a mailing list, general ledger or inventory.

Finding the right DBMS for you

When you're ready to go shopping for your relational data base management program, there are six characteristics that you should look at to adequately judge data entry, data retrieval, and programming: the absolute amount of information that can be entered into the system; the ease and flexibility of data entry; the ease, flexibility and speed of data retrieval; the report writing ability; the capacity of the processing language; and the documentation. It's a tall order and should be undertaken with the help of somebody who has some familiarity with data base management systems.

Now let's take a close-up look at these characteristics. When looking at each one, it may help to remember that most of the terms bandied about in data base management refer to the form in which data is defined and entered. In general, data consists of

High-end relational data bases not only let you enter and retrieve information, but manipulate it as well.

files, which can be visualized as large tables. The rows of tables are records, and the columns of the tables are known as fields or attributes in which one kind of data is stored.

• **Capacity**—Programs vary in the number of files that can be established, the number of records each file can hold, and the number of fields per record. Most publishers claim that their data base managers can set up as many files as the computer system's memory and disk drive can handle. Many programs can accept 65,535 records per file, a limit imposed by 8-bit personal computers. The number of fields per record runs from 25 to being limited by hardware restraints only. Programs often can hold about 255 fields per record. In our stockbroker example, this would mean that not only could data be manipulated according to a client's name, address, geographical location and phone number, but by such identifying fields as the type of stock held, account balances, last activity, and so on.

Additionally, most records and files can hold a limited amount of in-

formation, and that amount varies widely. Records may hold as few as 255 characters or as many as you want, limited only by the amount of memory and disk space. Field limits can range from 25 characters to the total extent of memory. Although the variation between programs is great, remember that most data encountered in traditional data processing tasks will run less than 100 characters per field. The upper limits are rarely reached.

• **Data entry**—Data base managers accept information in different forms. Some of the most widely used formats are numbers, alphanumeric, floating point, money, data, and real numbers. Some programs which are not preformatted can accept exotic data, but having the format is often useful and convenient. For one thing, it helps verify that the correct data has been entered. If, for example, the field identifying sex is formatted to accept only an "M" or "F" response, it will be more difficult to make a typographical error and identify

some poor person's sex as "N."

In examining the data entry facility, you must look at more than size of fields and files. The *ease* with which fields and files can be defined and changed also plays a key role. Let's say that you have set up a file of all of your customers. In each record in that file you included the customer's name, address, telephone number, last order, amount owed and amount paid. Since you have computerized your operation, you have decided to send a notice to a customer each time six months pass with no reorder, and you want to note each time you send a reminder. In buying a data base system you must check how easy it will be to add a field to all of those records. Another example from recent postal history was changing files to accommodate the extra digits in the expanded ZIP code system.

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• *Data retrieval*—"In my opinion, it is the ability to retrieve information that defines what a data base is really about," asserts Roy Moore, technical support coordinator at Ashton-Tate. "Data base management systems find and recall information in two primary ways. In the first, the program examines every piece of data, looking for the specific information requested. This method is called sequential access."

In large data bases, sequential access can be slow and laborious, like flipping through every index card in a 10,000 card stack. So most programs couple sequential access with an indexing scheme. An index links and sorts key fields. If a user wants to look at address fields, for example, the program first checks an index which directs it immediately to the appropriate records.

Since indexing steps up the speed of information retrieval considerably, the number of key fields and indexes a program can maintain plays a part in determining the program's retrieval speed. Another element in determining speed is the number of files a program can have open at once. This ranges from one to all the files established. In a program like dBASE II, for example, two files can be open at a time.

It also depends on the amount of information contained in the files.

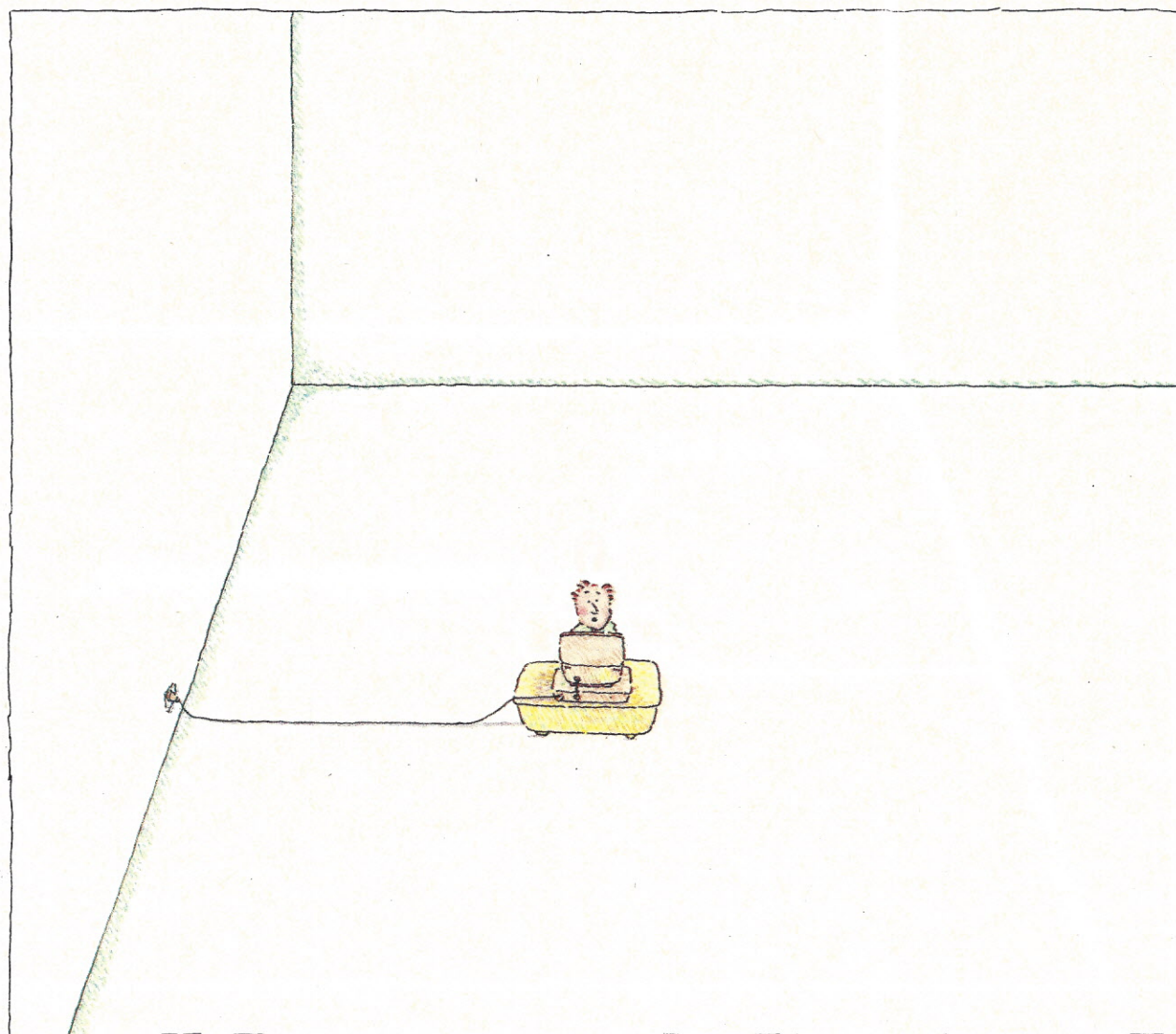
If, for example, our stockbroker, James Kelly, had 5000 records within his data base, and he asked for a list of everyone owning AT&T stock who had telephoned within the past year, his system would likely grind down under the sheer weight of responses. However, if he asked for a list of just those AT&T holders who sold 100 or more shares in the past week, the response time would be much more rapid.

Dick Bailey, manager of marketing communications for Micro Data Base Systems, publishers of Knowledge Manager, a relational data base

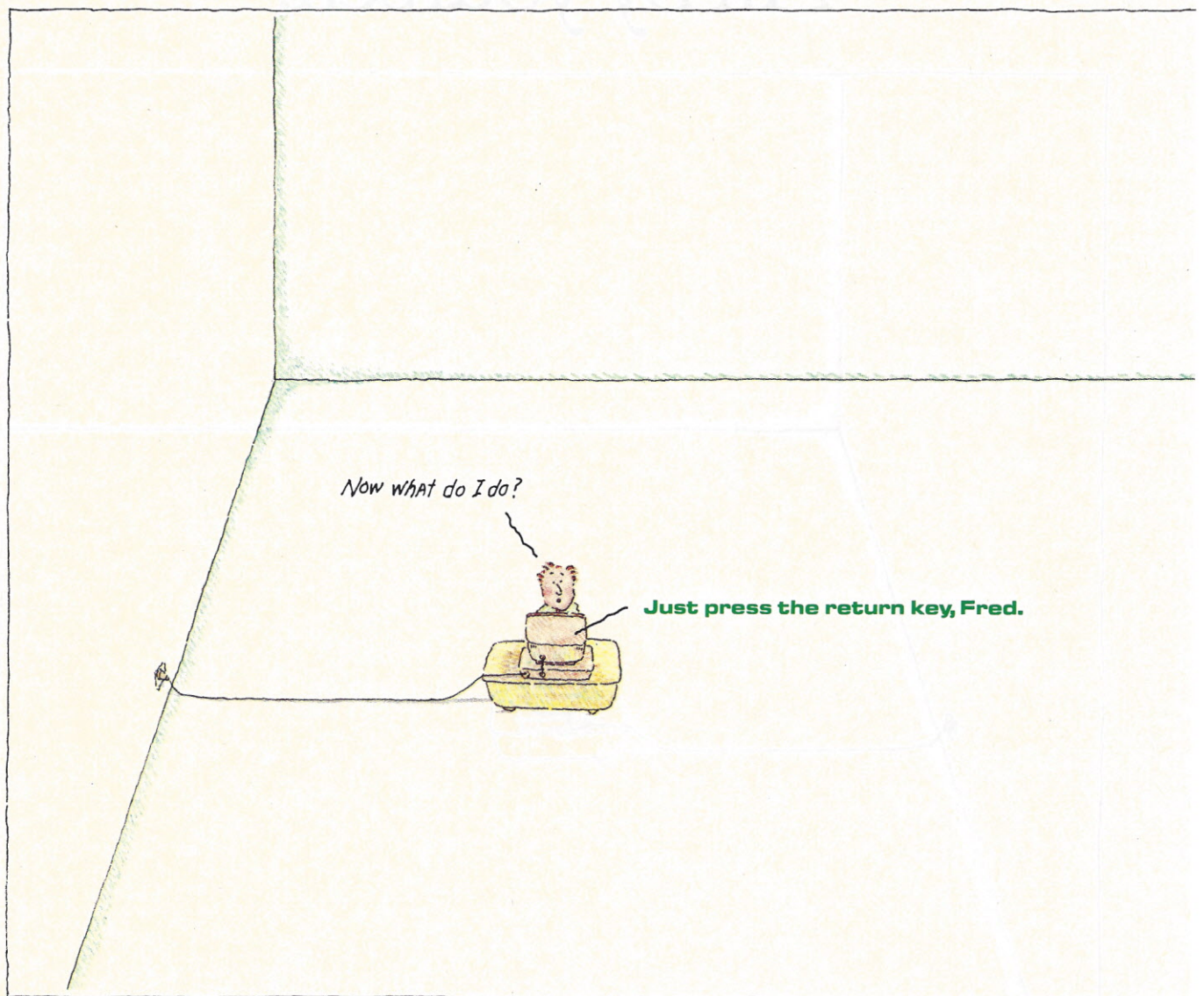
(continued on page 132)

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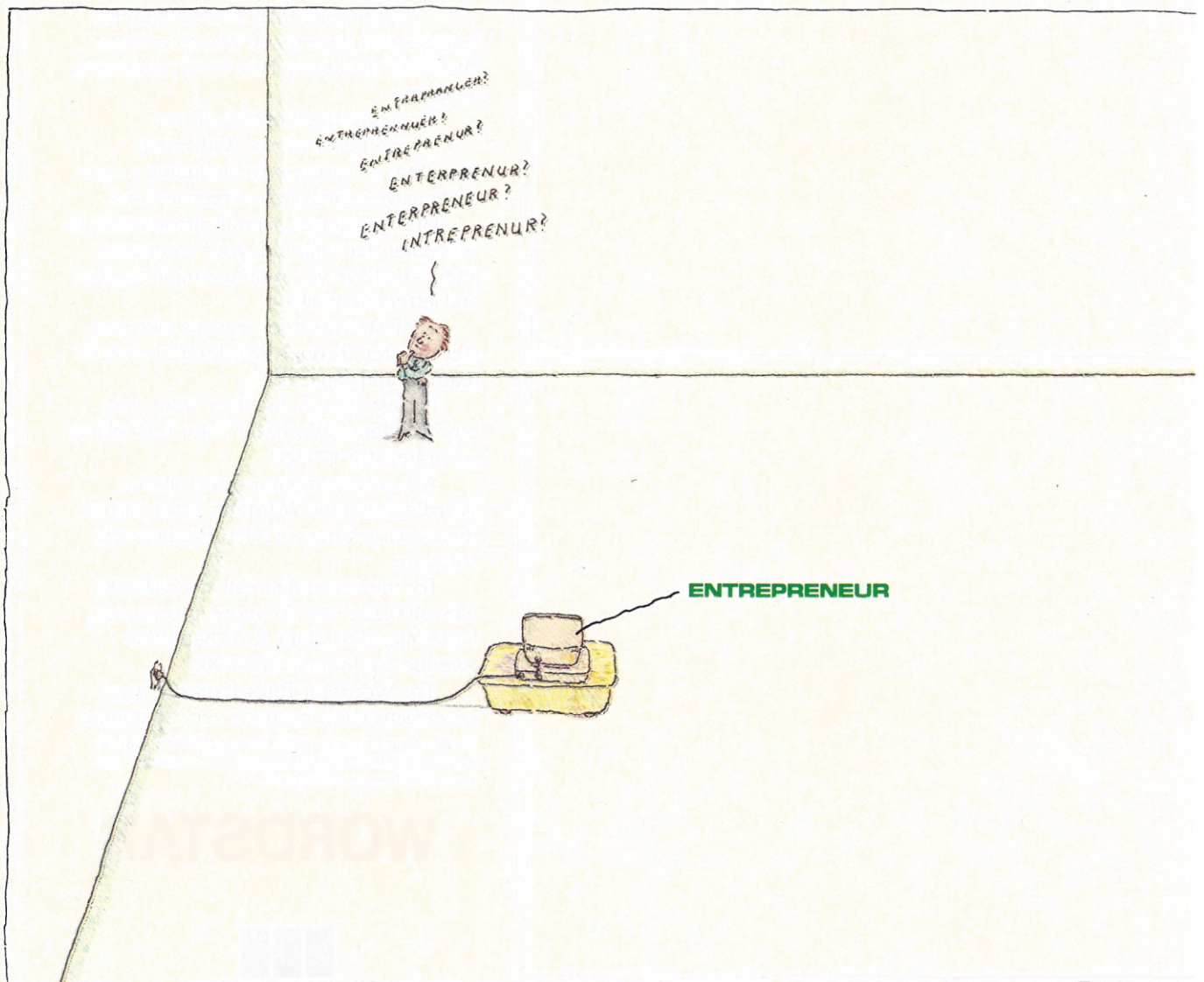
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CIRCLE 58

(continued from page 126)

system, cites statistics which indicate that some data bases could take as much as an hour to sort through 5000 records.

The central processing unit also affects the speed of a particular program. Data Ace, for example, can perform one task on an IBM XT in 27 seconds. The same program took 23 seconds on a Victor 9000, and 18 seconds on a Tandy 2000.

One of the strengths of data base management systems is the ability to recall specified subsets of information. Recalling Adam Green's story about the library, data base managers can summon the name of each library patron who lives in San Francisco and has checked out three books. Programs vary as to the number of conditions that can be defined for any single search.

- **Documentation**—Programs this powerful are necessarily complex, so ease of use becomes a valid concern. Data base management systems are often not menu driven. That is, the screen does not present a list of choices and guide the user step by step. Instead, the screen lies blank, waiting for the operator to remember and key in a command. Therefore, the clarity of the program's documentation and the availability of tutorials assume great importance.

- **Report generating**—The ability to generate reports varies between programs. Data Ace, for example, contains no separate report generator. Reports must be created through the programming language. Ashton Tate currently is developing a product designed to, in part, improve dBASE II's ability to produce reports easily.

- **Effective language**—When a data base management system has an effective language, third-party programmers will often write applications programs—programs that perform specific tasks—with it. To demonstrate the widespread acceptance of dBASE II, Ashton Tate has published a catalogue with hundreds

of vertical applications written using dBASE II's programming language. Among the choices are employment agency management, vehicle fleet management, and harness race handicapping. Other data base management systems have found similar, if less widespread, acceptance.

To write his own complex programs, asserts computer consultant Sharon Gates, a user would probably have to have some computer background. Others estimate that to get a working knowledge of most of the programming languages that come with data base management systems would require at least 80 hours of training for people without a computer background.

But even newcomers should be able to pick up the rudiments of programming in data base languages. They should be prepared to make a larger investment in time, however, than necessary for even the more complex word-processing or spreadsheet programs.

Given the difficulty of learning sophisticated data base management systems, how can you determine if you need a data base management system with programming capabilities or if you can use a piece of completely prewritten software? If what you want to do is a common application, chances are you can find a program that can do the job, and you don't need a customized data base system. But if you want customized software, you should look at data base systems.

The best way to know if a high-end data base management system will meet your needs is to study some of the ways they have been put to use. The following are three case studies:

Yehuda Fishman came to the United States from Israel last year in search of new technology for the industrial adhesives factory he managed. Fighting for market share at home and for a toehold in the Common Market in Europe, he knew he needed a decisive edge. He criss-

crossed this country, consulting with chemical engineers and other adhesives experts.

Fishman also investigated relational data base management systems. Although his factory was linked through an industry association to a mainframe computer, he had found himself relying more and more on his Kaypro 10 for fast and reliable management information. Using dBASE II, Sharon Gates developed a complete inventory and manufacturing control program, charting the production, packing, shipping, and inventory requirements for Fishman's operating conditions.

"The program was written completely to his specifications," notes Gates. "And it would have taken a lot longer if I was writing it in another language."

* * *

Shortly before Christmas two years ago, a budding entrepreneur approached Chris Horrocks of Computer Systems Designs about creating a data base management system for a mail-order company he wanted to launch. He wanted automatic order entry, immediate calculations of money owed and reconciliation with money paid, a subsystem that would track birthdays of children buying through mail order in order to send birthday cards, plus the ability to match inventory to orders, produce lists, and create sales reports. Using COBOL, the most common business programming language, it would have taken two years to write the program, Horrocks asserts. The entrepreneur, however, needed the data base management capabilities in *less than a month*. He knew that if he began his venture before his computer facility was in place, the computer facility would have been harder to implement, and the business would be less likely to succeed.

According to Horrocks, using the data base management system instead of a traditional programming language allowed Computer Systems

The best way to know if a high-end data base system meets your needs is to study how others are using it.

COMPANY/PACKAGE	SYSTEMS	PRICE	FILE STRUCTURES			FILE MANIPULATION	
			Records/ Per File	Fields/ Per Record	Characters/ Per Record	Key words/ Per Record	Multidisk Storage of One File?
ABW RL-1	IBM PC, XT; WANG; VIC	\$495	65,535	Limited by memory	Limited by memory	Any number of fields	N
ADI AMERICA Aladin	APL II, II+, IIe; IBM PC, XT, compatibles; ALT; DEC R, Prof; VIC; TI Prof; COR; HYP	\$595 (APL II+, IIe) \$795 (others)	65,535	512	4096	198	N
APPLIED SOFTWARE TECHNOLOGY VersaForm	APL II, IIe, III; COL; CPQ; COR; EAG; IBM PC, XT; TI Prof	\$389	30,000	APL 50 Others 75	4000	2 or all	N
ASAP SYSTEMS Asap Five	MS-DOS 2.0 and up	\$395	Limited by disk and memory	Unlimited	No set limit	2 or all	N
ASHTON-TATE dBASE II	MPC	\$700	65,535	32	1000	7	N
COMPUTER SOFTWARE DESIGN Data Ace	TRS II, 4, 12, 16; TANDY 2000; NCR; IBM PC, XT, and compati- bles; VIC; HP- 150	\$645	Limited by disk and memory	25	255	3	N
CONCENTRIC Concentration Information Processor	IBM PC, XT, and compatibles	\$395	65,535	40	2000	All	N
CONDOR Condor 3	MPC	\$650	65,535	127	1024	32	N
DJR ASSOCIATES FMS-80	MPC	\$395	65,535	255	About 25k	All	N
DAYFLO Dayflo	IBM PC, XT, and compati- bles w/ hard disk	\$495	65,535	32,000	32,000	30	N
SYSTEMS: ACT = Action ALT = Altos APL = Apple (II, II+, IIe, III) COL = Columbia (MPC) COM = Compaq COR = Corvus CRO = Cromemco DEC = DEC (Rainbow, Professional, 350, VT-180)		EAG = Eagle HP = Hewlett-Packard (86, 87, 125, 150) IBM = IBM (PC, XT) MOL = Molecular NCR = NCR (Decisionmate) OSM = OSM SAGE = Sage SAN = Sanyo SUP = Superbrain		TANDY = Tandy (2000) TI = Texas Instruments Professional TRS = Radio Shack (II, 4, 12, 16) TV = TeleVideo VIC = Victor (9000) WANG = Wang (PC) XER = Xerox (820) PRICE: M = Mail order R = Retail		RECORDS PER FILE: B = Billion M = Million OPERATING SYSTEMS: CT-DOS (Convergent Technolo- gies) MS-DOS CP/M CP/M 80, 86 UNIX ZENIX	

Design to develop a program in 18 days. "Also, the company's controller would come down Tuesdays and Thursdays for two hours as we worked, so by the time the program was finished it was *his* system. He knew it inside out," Horrocks recalls.

* * *

Ed Nazarko is the director of training, field audits, and administration for Ogden Security, a Boston-based subsidiary of the \$2.5 billion Ogden Corporation. When it came to purchasing accounting software, Ogden bought a packaged program, primarily because so much in accounting revolves around generally accepted accounting principles. But when it came to purchasing software for a guard-scheduling and payroll system for the company, which provides security officer and investigative services in five cities, Ogden purchased a data base management system.

Using Data Ace, Nazarko developed a system to match guards with particular skills to client sites with individual requirements. The system matches people with work slots on a 24-hour, seven-day-a-week basis. It restricts the scheduling of guards who are not qualified to fill a particular slot and allows the company to avoid scheduling overtime for a guard if the whole roster has not yet worked 40 hours a week.

Each Ogden office may fill 4000 work slots a week using a 200-person labor pool. Each slot may have as many as five different pay rates, depending on the guard's qualifications. Once the work has been verified, the data base management system generates a payroll report, as well.

The system took about four months to develop. "If the information wasn't as sensitive as payroll information is, it would have taken about a month," says Nazarko, who wrote large sections of the program. His computer background consists of one graduate level course taken in business school.

Ogden Security decided to develop

its own system using a data base manager because it needed a custom program, and it turned to a personal computer instead of utilizing the mainframe computer resources of its parent company so the end result would be closer to what they wanted.

"We were trying to emulate the way our managers made scheduling decisions," says Nazarko. "I don't think you could have data-processing personnel develop a system and then go out in the field and force people to use it." Also, given the flexibility required in scheduling large numbers of people, Nazarko felt that it wouldn't be practical for managers if they had to dial into a central system 10 times a day.

"Using a personal computer made a lot of sense," Nazarko says. "It gives managers a day-to-day management tool so they can catch problems on Tuesday instead of waiting for a payroll sheet the following Monday."

The program, Nazarko admits, has had to be completely revised. "We deal in quarters of hours, and the order-entry package deals in single units. You can't have a quarter of a widget," he jokes. But he still feels the project was a success.

* * *

NDC Systems in Duarte, Calif., manufactures industrial measurement devices. Though relatively small (sales under \$5 million), it is another example of a company implementing personal computers rather than using larger minicomputers or mainframes. The firm has a DEC minicomputer, but it turned to dBASE II to develop a sales quote tracking system. According to Daniel Fishman, the company's computer consultant, the system converts the uncertainties of projected sales into a credible forecast of expected bookings, providing key information the company never had before.

Using the dBASE II application, NDC's sales representatives report sales leads, the value of the potential

sales, the month they hope to close the sale, and assign a probability that the deal will be brought to a successful conclusion. Thus a sale worth \$50,000 with a 50 percent probability of closing in June gets an assigned worth of \$25,000. This kind of calculation would not be possible with a simple file manager that merely retrieves data.

By calculating every sales lead, Fishman notes, NDC can plan production schedules and order inventory accordingly. Also, the company often finds its representatives contacting different divisions of a prospective customer in different states. Alerted when this occurs, the representatives can now help each other make a sale.

When asked why she felt the company went the personal computer route as opposed to using the in-house minicomputer, Sharon Gates said she felt it was because this type of application is more cost efficient. "This is a personal application," she says, "It's more traditional to use a mini for multiuser applications."

These are just a few examples of how data-base management systems have accelerated the proliferation of personal computers in large corporations by giving individuals the power to collect, manipulate, and analyze large amounts of data at will. At the same time, the software provides smaller businesses and professionals with the ability to perform tasks once limited to the data-processing departments of Fortune 500 companies.

If you need to customize a data base management program, you should be prepared to spend a little time getting it up and running—but in the long-term, the investment you make will be well worth your while. For in the end, you'll have a program sophisticated enough to give you just what you need—yet simple enough to provide it at just the time you need it. And that can make any job easier.



“Using a personal computer makes a lot of sense . . . it gives managers a day-to-day management tool . . . ”

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			Records/ Per File	Fields/ Per Record	Characters/ Per Record	Key words/ Per Record	Multidisk Storage of One File?
EXCALIBUR TECHNOLOGIES Savvy	APL II, II+, IIe; IBM PC, XT, and compatibles	\$495 (APL with copro- cessor \$395 (IBM))	20,000	255	1024	All	N
FOX RESEARCH IO Base	IBM PC, XT, and compatibles	\$495	Limited by disk and memory	32,000	32,000	All	N
MAG SOFTWARE MAG/base ³	MPC	\$795	999,999	999	4096	99 (each key can have 10 fields)	N
MICRO DATABASE SYSTEMS Knowledge Manager	MPC	\$500	65,535	255	65,535	All	Y
MICROPRO Infostar	MPC	\$495	65,535	255	65,535	32	Y
MICRORIM R: Base	IBM PC, XT, and compati- bles; TI Prof; DEC R; HP- 150; VIC; CT- DOS	\$495	2.5 B	400	1530	All	N
ORACLE Oracle	UNIX, ZENIX, MS-DOS	\$600 to \$2000	Limited by disk	254	16,056,000	254	Y
PEARLSoft RELATIONAL SYSTEMS INTERNATIONAL Personal Pearl	MPC	\$295	Up to 8M	250	250 multiplied by width of screen	All	N
RELATIONAL DATABASE SYSTEMS Informix	MPC	\$795 to \$1600	Limited by disk	2,048	2048	All	N
STONEWARE DB Master	APL II, II+, IIe, III	\$350	Depends on rec- ord and key length	100	1020	Up to 35 bytes	Y
Advanced DB Master	IBM PC, XT, and compatibles	\$595	Up to 1,000,000	Limited by memory	3000	50 bytes	Y
UVEON COMPUTER SYSTEMS Optimum DBMS	IBM PC, XT, and compati- bles; MOL; OSM; DEC R; TI Prof; ACT; WANG; VIC; TV 8-, 16-bit, 1605	\$595	8M	50	12,500	3	N

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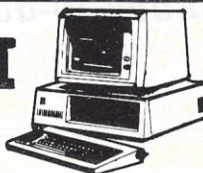
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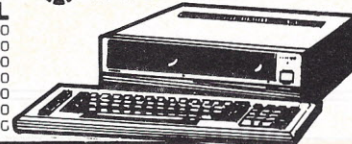
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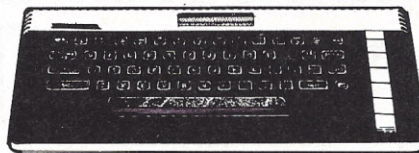
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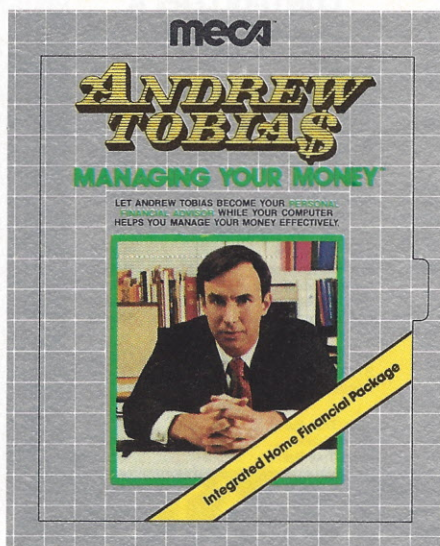


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Are Two Drives Better Than One?

If you have questions dealing with hardware, software, or applications, Personal Computing will answer them in this monthly column. Please send your 'need-to-knows' to: Answers, Personal Computing, 10 Mulholland Drive, Hasbrouck Heights, New Jersey 07604.

Q. Using Lotus 1-2-3 on an IBM Personal Computer at work, I have grown accustomed to the convenience of a dual disk drive system. When I have questions, I can press a Help key and the computer will access disk drive A and give me Help menus. If I buy an Apple IIe with only one disk drive for home use, will I lose this convenience?

A. For many programs, especially in the entertainment and educational categories, two disk drives are not necessary. The dual disk drives make it easier to store data to disk (such as word processing files or data base files like mailing lists), but for games and such, when there is generally no data to store, one disk drive is sufficient.

For more complex programs, however, it can be a real help to have two disk drives—as you've already discovered. According to Ezra Gottheil, manager of technical communications for Lotus, two disk drives are necessary to make full use of Lotus 1-2-3's Help capabilities. If you had only one drive, whenever you wanted to access your data disk you'd have to remove the Lotus disk, which contains the Help files. You wouldn't be able to access both the Help files and your data files at the same time.

With two disk drives, once the program is loaded you have access to all the Help files. "It's very handy," Gottheil says. "While it would be possible to use the system with swapping, it would greatly reduce the convenience of using the program."

If you're not sure how complex your home applications will be, we'd suggest buying one disk drive to start with. You can always add another later if you decide that's what you want.

Take note, however: If you buy an Apple IIe for your home, you will lose the convenience of Lotus 1-2-3 altogether! The program does not run on the IIe because that computer simply does not contain enough memory. The program does run on the following machines: DEC Rainbow 100, Grid Compass, Compaq, Hyperion, Columbia, Texas Instruments Professional, Wang Professional, Zenith Z-100, Hewlett-Packard 100 and 150, and, of course, the IBM Personal Computer, XT, and 3270.

Q. I've been told my Okidata 92 Microline dot-matrix printer doesn't understand the underlining control in the Applewriter II word processing program I use. Does this mean I can underline only by using a string of control characters? Is there any software or hardware I can get to make underlining easier?

A. According to Okidata's staff, Applewriter II is written for a printer that can backspace; your printer doesn't do that. For Applewriter II, and for any word processing software you use, you will

have to use control characters to tell your printer to underline.

Living with the problem is not so bad, though. Applewriter will allow you to imbed control characters in your text to instruct the printer when to underline. When you come to the word you want underlined, enter Control-V, Escape-C, Control-V. Then type your word, followed by Control-V, Escape-D, Control-V. When printed out, the word you typed will be underlined.

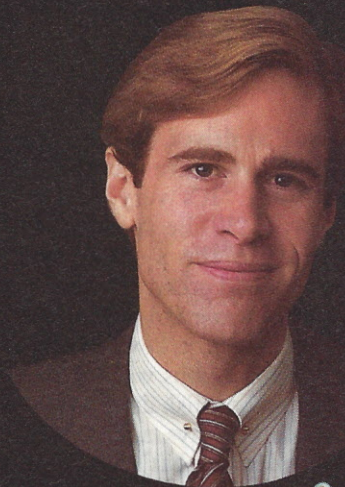
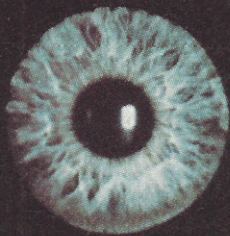
If this still bothers you, you can always get a new printer, one that Applewriter II directly addresses. But this seems an expensive solution to a not-so-awkward problem.

Q. I've heard that some Sony and Toshiba televisions have direct computer capability, and I understand you can hook a home computer, such as the Commodore 64, directly into them without using an RF modulator. Is this so? What are the advantages besides convenience?

A. Leon Cabarcas, information technician for Toshiba, says there are currently four Toshiba models on the market that offer direct jack hookup for a computer: the CZ9700, CZ1413, CZ2010, and CZ2013. The CZ1413, CZ2010, and CZ2013 all use an FST tube, which is the flattest tube on the market and gives the highest resolution, according to Cabarcas.

You can connect a personal computer directly into a jack on the back of these sets, bypassing the RF modulator box, provided the computer has composite output capability. Com-

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CIRCLE 49

ANSWERS

posite output keeps the audio and video signals separate, and a computer with composite output capability will have two standard RCA output jacks, one for audio and one for video. All you need are two wires, each with two male heads that plug into the output jacks on the computer and the input jacks on the back of the TV, and it becomes a computer monitor.

If your computer has only one standard RCA plug, such as that on the Commodore 64, it means the audio and video signals are mixed together and must be separated again through a modulator. So you have to use a device such as the RF box that comes with the 64.

The advantages of direct composite connection are twofold. The less important perhaps is the convenience factor, especially if you have your set hooked into a cable service. It means there are fewer black boxes and connections you have to hook up, and less possibility of confusion.

As Cabarcas explains, the main advantage of hooking a computer into a TV through the composite signals is that you get cleaner signals from the computer and a higher screen resolution than if you go through an RF modulator. Cabarcas says there are three main stages for a signal going into a television. The first stage is the RF modulator stage; the second is the video amplifier stage; the third is the video output stage. A composite hookup lets you bypass the first stage, and hook into the video output stage, rendering a better signal and picture because as Cabarcas says, "Every time you go through one stage, you lose part of the signal and resolution."

Toshiba plans to have two new models on the market soon which will allow RGB inputs. Then if your computer has RGB output, you can hook it into the television and bypass the first and second stages, giving you an even cleaner signal and better resolution. The models, which may be on the market when this is published,

are the CZ2074, and the CZ1474. Toshiba has a hot-line number for questions about the capabilities of Toshiba sets: (800) 221-0314.

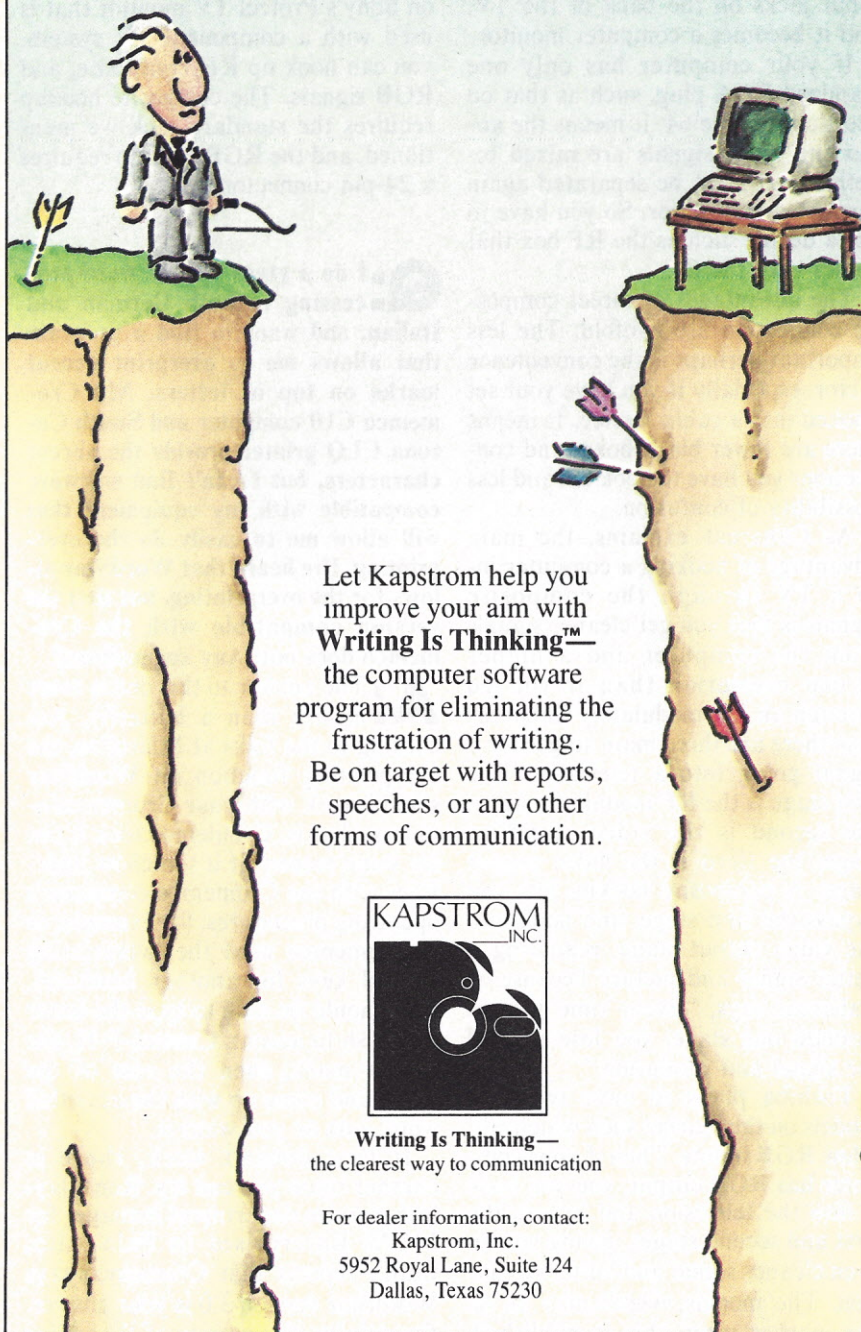
According to a spokesperson at Sony, Trinitron models require an RF hookup, you can't hook them up via a composite connection. However, on Sony's Profeel TV monitor that is used with a component TV system, you can hook up RF, composite, and RGB signals. The composite hookup requires the standard jack we mentioned, and the RGB hookup requires a 24-pin connector.

Q: I do a great deal of word processing in both German and Italian, and want to find a program that allows me to overprint accent marks on top of letters. My Cromemco C10 computer and Smith Corona CLQ printer provide the accent characters, but I can't find software compatible with my equipment that will allow me to easily do the overprinting. I've heard that WordStar allows for the overprinting, but that the version compatible with the Cromemco does not. Any suggestions?

A: The answer to this one is more elusive than a butterfly. According to the folks at MicroPro, the overprinting function on WordStar should work with your Cromemco—unless, that is, Cromemco took it out for some reason (if it somehow interferes with the Cromemco computer's operating procedures, for example, or if Cromemco used the overprinting control keys for another function). You should be able to type the letter you wish to accent, Control-P-H, the accent mark, then the rest of the word, and come up with the accented word, just as you want it.

If that doesn't work, there is another route you can try. Ron Blaylock, service department manager for MCM Enterprises in Palo Alto, Calif., reports that Cromemco says WordStar version 3.0 is your answer. Essentially, this version of WordStar

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ANSWERS

allows you to use control keys to backspace and overprint. In the "install" program, when you install the software for your own computer, you can set it up at the first menu to automatically print the accented character when you hit a special function key. The more recent version, WordStar 3.3, reportedly does not allow you to do this.

A third option is to hire a software consultant to customize your software to perform the functions you want. It may seem drastic to resort to fiddling with the programming itself, but if you do as much word processing in different languages as it sounds like you do, and neither of these other two solutions works, it could very well be worth it to you.

Q: I am planning to move to West Germany, and would like to buy a personal computer before I leave the U.S. What problems am I likely to encounter as far as electrical current, customs, and the shipment of the equipment?

A: Wayne Graham, a senior computer technician at NEC Home Electronics, has a few suggestions. He says the biggest problem in taking a personal computer from the U.S. to Europe will involve getting the proper electrical current for your machine. European countries run an electrical current of 220 volts, while the U.S. regularly uses only 110 volts. Something called a step-down transformer, though, should effectively deal with that problem, according to Graham.

"A step-down transformer will effectively change the current coming into the AC adaptor from the European (electrical) current to the American, and it'll work fine," Graham explains. He advises buying the AC adaptor and the step-down transformer, as well as the computer, before you leave the U.S. to avoid any problems with availability.

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are more likely to take factors such as voltage differences into account since they are designed to be used and marketed internationally. The Hewlett-Packard HP-150, for example, has a voltage switch on the back of the unit to do the regulating from 110 volts to 220 volts and vice-versa, making a step-down transformer unnecessary. It's a good idea to ask your dealer a few questions about the electrical current, availability of hardware accessories and software, etc. for whatever computer you're thinking of buying.

As far as shipping your personal computer, Graham says it should not be a difficult process. Probably the best packaging you can use is the same wrappings and box that the

computer came in, he notes, but any sturdy box with Styrofoam and a plastic bag around the machine itself (to keep out Styrofoam bits and moisture) should do the trick. As for customs, the normal procedure of declaring your property should apply, but to avoid any misunderstandings, you should check with the U.S. Customs Bureau before you get started.

Q: A friend and I made a bet. I say that BASIC is the easiest language to learn, he says it is the hardest. Which one of us is right?

A: According to Doug Mosher, author of *Family Computers under \$200*, *Your Color Computer*, and co-author of *Portable Comput-*

ers (all published by Sybex), neither of you is right.

"BASIC is absolutely not the hardest," Mosher says. "I could name a number of obscure languages that could be candidates for the hardest. The person who said it's the hardest is the most wrong. The person who said it was the easiest to learn is also wrong but not as badly wrong."

Mosher says there are two candidates for the easiest language. If you're talking about general purpose languages, "Logo is probably the fairest answer," he says. Runners-up are certain software products which some people argue are languages—programs like dBASE II, Lotus 1-2-3, and WordStar. "Products such as those could be called languages

War

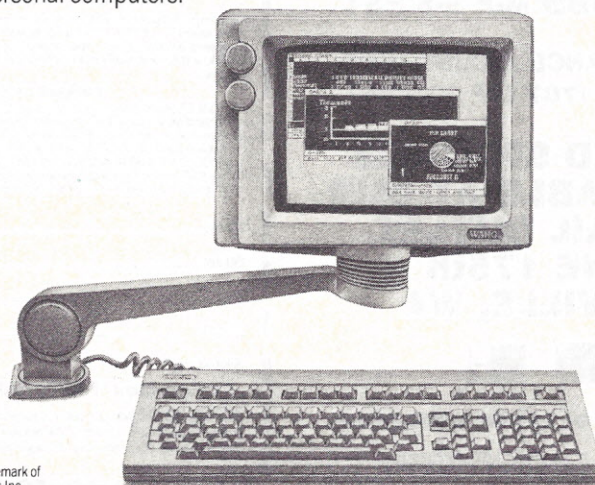
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that are easier to learn than BASIC."

However, he adds, "BASIC is unquestionably the most widespread general-purpose language that is relatively easy to use on personal computers; and in some cases it might be considered easier to learn because your friends and associates would be able to help you."

Q: I am considering the purchase of my first computer, but to my dismay most manufacturers only have a 90-day warranty. How long can a personal computer system such as an IBM or Apple be expected to last?

A: Years. Computers themselves have very few moving parts, which makes them prone to few

breakdowns. According to Rick Hyde, who works in Apple's intercontinental service department, "Typically, if a chip is going to fail, it's going to fail early in its life. If the machine does not fail within the first few weeks, it's likely to run for quite some time." Any computer manufacturer, he adds, should be willing to supply "mean time between failures" information, which should give you a good idea of how frequently breakdowns do occur. These figures will give you a good basis for comparing the reliability of different systems.

If the guarantee of a longer computer-life is still important to you, you might consider purchasing some kind of service contract which

many manufacturers offer. You pay a certain fee and in return, you get what boils down to an additional warranty period, with the manufacturer taking care of whatever repairs need to be made. (Apple's program, for example, is called Apple Care, and covers service for a year.) Your computer dealer should be able to sell you the policy.

Q: I'm going to be using a television as a monitor for my Commodore 64, and I was wondering if it makes any difference what make or model I use.

A: Joe Hamer, manager of the Video & Computer Place in
(continued on page 148)

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On the other hand, the Wang PC is compatible with IBM and most other computer systems.

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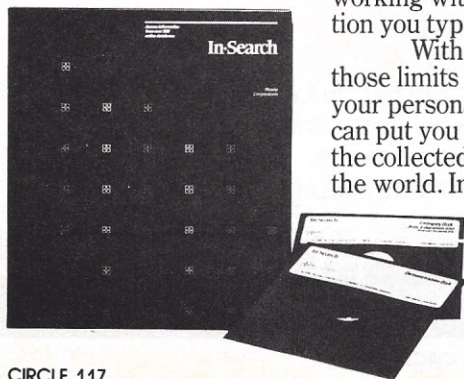
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CIRCLE 157

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ANSWERS

(continued from page 145)

Medina, Ohio, says virtually any television set will work with the Commodore 64. Hamer's dealership sells computers, video cassette recorders, and some TVs. Hamer does recommend using a set with superior resolution and adds, "the Sony and Toshiba TVs probably have the best pictures in the business. If I were going to use a TV set with a computer, I'd go with a Sony."

Q: I want to buy a computer, but I may have to justify the purchase to my wife? Any suggestions?

A: According to John Barlow, technical services manager of Computer Center Stores in San Jose,

Calif., the first thing that must be determined is exactly *who* the computer is for. Along the way, he says, "We point out the time-management savings, the spreadsheet programs which let you balance budgets, the educational programs for the kids, and the word processing capabilities."

And if none of that works, try asking Santa Claus for one for Christmas.

Q: Is there a data base program I can use to build a data base larger than one diskette in size?

A: John Frost, manager of the ComputerLand in Novato, Calif., says such programs do exist.

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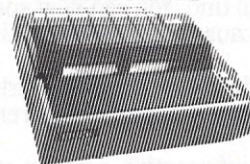
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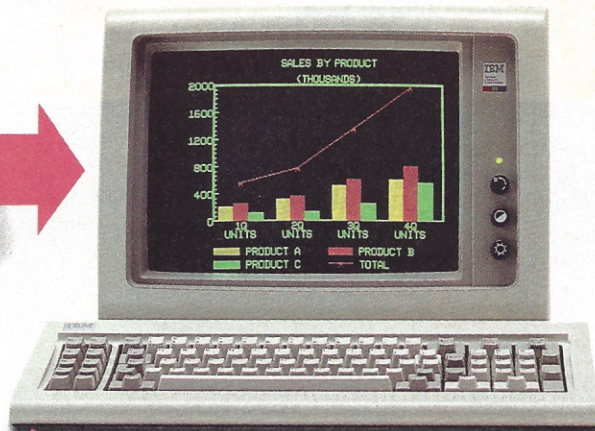
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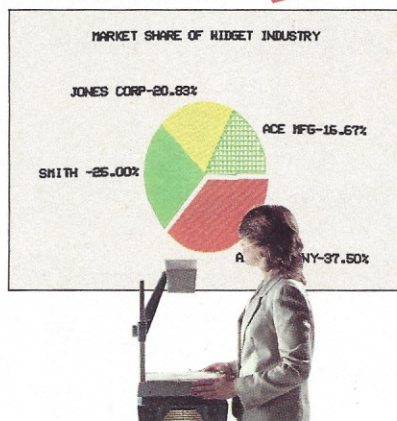
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ANSWERS

He feels that although hard disk systems are taking more and more of the market as their prices drop and user files increase in size, most serious data bases managed on personal computers today reside on floppy disk systems.

However, he's noticed that many of the leading data base or file management software for the IBM and Apple computers limit a given data base file to one disk's-worth of data, but he's seen one exception to this in Advanced DBMaster from Stoneware. It runs on Apple, IBM, and compatible systems, and can manage files that fill up to 44 disks, according to Frost.

"Actually, I don't believe that anyone should try to manage active files

on more than four to eight diskettes," says Frost.

But just because a file spills over from one diskette is not sufficient justification to invest in a hard disk system at today's prices. Frost has also seen that most data bases grow gradually up past single floppy disk right up to hard disk size. So he advises buyers to start with a data base manager that will let you start with floppies, expand to more than one, and eventually move up to hard disk—without having to rekey the information.

Q: I'm thinking of switching to a word processing program that uses the ProDOS operating system.

Will I still be able to edit my old DOS 3.3 files with it?

A: Yes, but you'll need to convert your old files to do so. If the word processing program is Word Juggler IIe from Quark, it features a built-in utility for converting DOS 3.3 files to ProDOS. Otherwise, you'll have to use Apple's own utility for converting either from DOS 3.3 to ProDOS, or the other way around.

Q: Digital Equipment Corp. and some other computer makers boast about having "dual processors." Does that really translate into benefits for the buyer?

A: An answer to this one comes from Bill Vick, president of

BY THE TIME
YOU DISCOVER
A WHEN OUT
DISK, IT'S PROBABLY
TOO LATE.

Shepard and Vick, a Dallas, Texas computer dealer. According to Vick, a good dual-processor computer gives you software versatility, coupled with some operational benefits.

Applications software tends to cluster around popular operating systems like CP/M (-80 and -86) and MS-DOS, both of which the DEC Rainbow can run. So with two processors, you tap into more than one software applications "cluster."

The cluster for CP/M is very large, since much of the 8-bit applications software of the last six years is CP/M-based. CP/M-86 and MS-DOS provide some compatibility with the burgeoning software base of the IBM Personal Computer. MS-DOS in particular is extremely

close to IBM's PC-DOS, so that adapting IBM programs to MS-DOS machines is often easy (usually a matter of adjusting to different keyboards and displays).

This makes computers like the Digital Rainbow 100 theoretically capable of running many thousands of programs. The real number is much smaller, though, because each individual program has to be checked out and adapted as needed; and prudent buyers will look for software that's guaranteed to run on their particular make and model of computer—"MS-DOS-compatible" isn't enough.

Vick says that at this time, the Digital Rainbow will run some 800 applications. That number won't help

you if the one application you need isn't on that list, but it makes for good odds that you'll find what you're looking for.

In addition to the software flexibility, Vick says the Digital's dual processors—a Z80 and the same Intel 8088 the IBM uses—provide some performance advantages as well. Whichever is not being used to drive the software is doing some of the system utility work. Vick feels this helps make the Rainbow more efficient.

Q: I have an Atari 800 and a TRS-80 Model 100, both of which I use with a Mannesmann Tally MT160L printer. I'm tired of pulling

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ANSWERS

the printer cable out of one computer and plugging it into the other every time I need to switch computers. Is there any relatively inexpensive way to feed both computers into the printer at the same time?

A: Yes, there are at least two ways to feed two computers into the same printer, and both ways are relatively inexpensive. According to Dan McGowan, a senior technical support specialist with Mannesmann Tally, the easiest way to accomplish this dual feed would be to simply use two interface cables. Since the MT160L printer has both a serial and parallel port, you can connect one computer to each port with the appropriate cable. Then when you want to switch from one computer to

the other, you go to the front panel of the printer and configure it for (among other things) the port you're going to be using by answering the Yes-or-No questions the printer asks of you. The whole switching procedure should take only a minute or two, says McGowan.

If that isn't quick enough for you, there is another option. You can buy a switch box (there are a number of them on the market) which, when connected, will allow you to just flip a switch to feed data from one computer or the other to the same printer.

Q: I'm considering the purchase of a Kaypro 2 for my small business, but salesmen have never

been able to show me software that can do what I want: general ledger, accounts payable, accounts receivable, payroll, etc. Is there any available for the Kaypro? I've also been told it was necessary to have three disk drives to do this work. Is that true?

A: You're in luck. The company now provides the accounting program you're looking for, at \$200 per copy. Contact a local computer store which sells Kaypro equipment and ask to see Accounting Partner (made by Star Software), a complete general ledger accounting package which includes accounts receivable, accounts payable, and inventory features.

(continued on page 156)

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TOP SELLERS

1. Week of Jan. 30, 1983. Lotus 1-2-3. No. 1.
2. Week of Feb. 6, 1983. Lotus 1-2-3. No. 1.
3. Week of Feb. 13, 1983. Lotus 1-2-3. No. 1.
4. Week of Feb. 20, 1983. Lotus 1-2-3. No. 1.
5. Week of Feb. 27, 1983. Lotus 1-2-3. No. 1.
6. Week of March 6, 1983. Lotus 1-2-3. No. 1.
7. Week of March 13, 1983. Lotus 1-2-3. No. 1.
8. Week of March 20, 1983. Lotus 1-2-3. No. 1.
9. Week of March 27, 1983. Lotus 1-2-3. No. 1.
10. Week of April 3, 1983. Lotus 1-2-3. No. 1.
11. Week of April 10, 1983. Lotus 1-2-3. No. 1.
12. Week of April 17, 1983. Lotus 1-2-3. No. 1.
13. Week of April 24, 1983. Lotus 1-2-3. No. 1.
14. Week of May 1, 1983. Lotus 1-2-3. No. 1.
15. Week of May 8, 1983. Lotus 1-2-3. No. 1.
16. Week of May 15, 1983. Lotus 1-2-3. No. 1.
17. Week of May 22, 1983. Lotus 1-2-3. No. 1.
18. Week of May 29, 1983. Lotus 1-2-3. No. 1.
19. Week of June 5, 1983. Lotus 1-2-3. No. 1.
20. Week of June 12, 1983. Lotus 1-2-3. No. 1.
21. Week of June 19, 1983. Lotus 1-2-3. No. 1.
22. Week of June 26, 1983. Lotus 1-2-3. No. 1.
23. Week of July 3, 1983. Lotus 1-2-3. No. 1.
24. Week of July 10, 1983. Lotus 1-2-3. No. 1.
25. Week of July 17, 1983. Lotus 1-2-3. No. 1.
26. Week of July 24, 1983. Lotus 1-2-3. No. 1.
27. Week of July 31, 1983. Lotus 1-2-3. No. 1.
28. Week of Aug 7, 1983. Lotus 1-2-3. No. 1.
29. Week of Aug 14, 1983. Lotus 1-2-3. No. 1.
30. Week of Aug 21, 1983. Lotus 1-2-3. No. 1.
31. Week of Aug 28, 1983. Lotus 1-2-3. No. 1.
32. Week of Sept. 4, 1983. Lotus 1-2-3. No. 1.
33. Week of Sept. 11, 1983. Lotus 1-2-3. No. 1.
34. Week of Sept. 18, 1983. Lotus 1-2-3. No. 1.
35. Week of Sept. 25, 1983. Lotus 1-2-3. No. 1.
36. Week of Oct. 2, 1983. Lotus 1-2-3. No. 1.
37. Week of Oct. 9, 1983. Lotus 1-2-3. No. 1.
38. Week of Oct. 16, 1983. Lotus 1-2-3. No. 1.
39. Week of Oct. 23, 1983. Lotus 1-2-3. No. 1.
40. Week of Oct. 30, 1983. Lotus 1-2-3. No. 1.
41. Week of Nov. 6, 1983. Lotus 1-2-3. No. 1.
42. Week of Nov. 13, 1983. Lotus 1-2-3. No. 1.
43. Week of Nov. 20, 1983. Lotus 1-2-3. No. 1.
44. Week of Nov. 27, 1983. Lotus 1-2-3. No. 1.
45. Week of Dec. 4, 1983. Lotus 1-2-3. No. 1.
46. Week of Dec. 11, 1983. Lotus 1-2-3. No. 1.
47. Week of Dec. 18, 1983. Lotus 1-2-3. No. 1.
48. Week of Dec. 25, 1983. Lotus 1-2-3. No. 1.
49. Week of Jan. 1, 1984. Lotus 1-2-3. No. 1.
50. Week of Jan. 8, 1984. Lotus 1-2-3. No. 1.
51. Week of Jan. 15, 1984. Lotus 1-2-3. No. 1.
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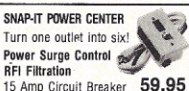
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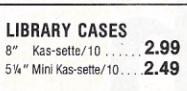
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CIRCLE 7

ANSWERS

(continued from page 152)

The package will run on both the Kaypro 2 and the Kaypro 10, according to Margaret Phanes, Kaypro's public relations director. But with the Kaypro 2 and only two drives, you'll be limited to tracking about 75 accounts. If you think your information storage needs will be greater than that, the Kaypro 10, with its 10 Mbytes of storage, would be recommended, Phanes says. That computer, by the way, runs about \$2795.

Q: I don't know how to type, but I do quite a bit of writing. How can a computer help me?

A: Most non-typists, or people who type with one finger, find computers to be a dream come true. Even if you can't type nearly as fast as you can write, the time you save by not having to write a second or third draft more than makes up for the lack of speed, says John Weingarten of Mission Computer Centers of Northern California.

More important than the time you save is the improvement in the quality of your writing, says Weingarten. When you can make changes on the computer screen before you commit your words to paper, you settle for fewer compromises.

There's one more benefit for non-typists who buy computers: You can buy a typing tutor program and teach yourself how to type.

Q: What's the difference between a file management program and a relational data base manager?

A: According to Brad Roth, sales consultant at Infomax Computers in Walnut Creek, Calif., file management programs allow you to store, retrieve, and sort one file containing records with the same set of data in them, such as mailing lists, customer lists, recipe collections, and the like. Relational data base managers, on the other hand, allow you to

manipulate more than one file, each of which might have records with different sets of data in them, such as an inventory or a customer list.

With relational data bases, you can link individual items of information, or fields, from one file to another, so that if you changed a part number in your inventory file, for example, it would automatically be changed in the accounts receivable files.

For personal applications, a file management program is usually adequate; relational data base management programs are generally used for heavy business or record-keeping applications like accounting. Another difference is that file management programs cost a good deal less than relational data base programs and, because they are used on smaller sets of data, they generally require less storage space.

Q: What are batch files and what are the benefits of using them?

A: Batch files are small execution programs that are addressed from MS-DOS, says Russ Bacon, sales manager of ComputerLand in Walnut Creek, California. They can be used to save time inputting standard information into the computer, such as the name of the program you want to run, immediately, whenever you boot the system (you could have WordStar automatically loaded into memory, for example); information about turning on modems or printers; information going to those devices (such as control codes for printers to make them print condensed modes, or emphasized modes); or the kind of screen display you want (instructions to have a color monitor display certain colors, for example).

Batch files also allow you to group a series of functions together and have them performed one after the other automatically. You could create a batch file containing a small BASIC program that sets your

printer to print enhanced characters along with a WordStar execution routine. Then, you would automatically configure your printer and then load WordStar when the system was booted.

You can link up a disk's worth of small programs in a batch file and have them execute, one after the other. This saves you lots of time in issuing the commands.

Q: I've seen the terms CP/M, CP/M-80, and CP/M-86. What's the major difference between them?

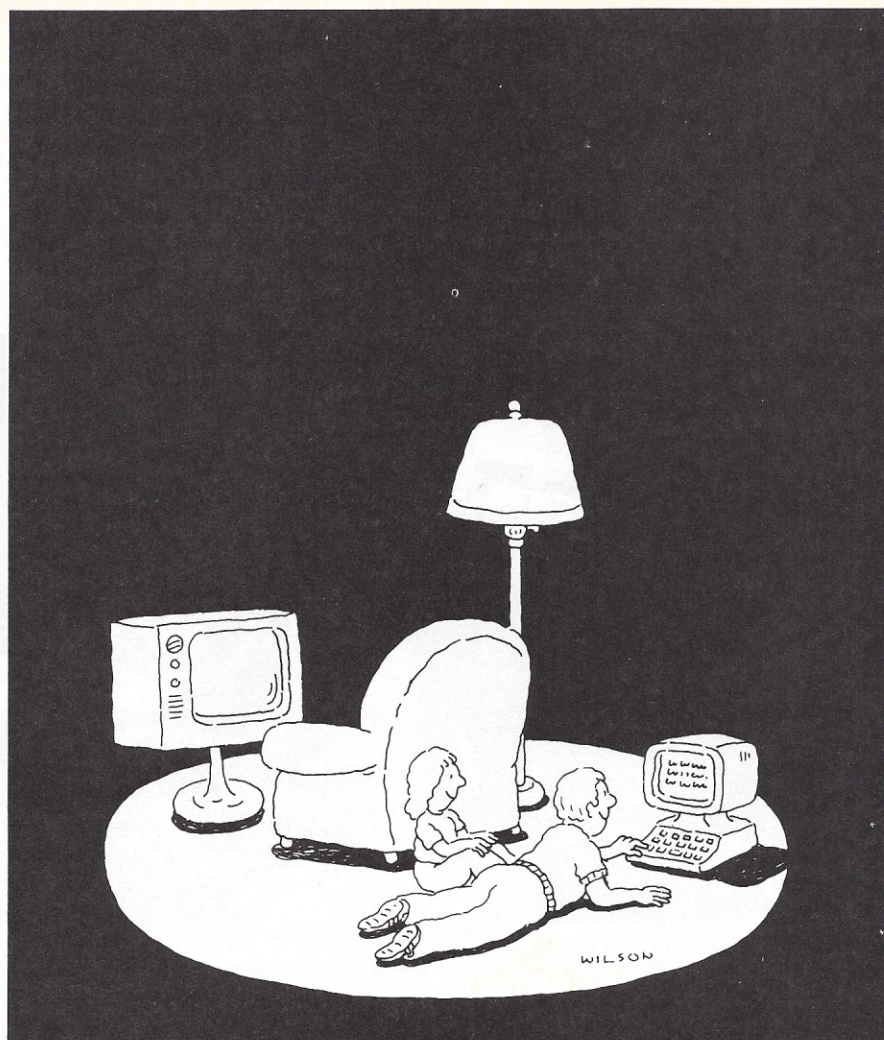
A: The differences in CP/M versions, the disk operating system developed by Digital Research, have to do with the computers they're designed to work with—more specifically with the microprocessors inside the computer, according to Jay Alling of Digital Research.

CP/M and CP/M-80 are identical operating systems, Alling explains, and the "80" in CP/M-80 refers to the 8080 microprocessor chip that the system is compatible with. CP/M (CP/M-80) is designed to work with 8-bit personal computers.

CP/M-86, on the other hand, is a version of the CP/M operating system designed to work with 16-bit computers. The "86" in CP/M-86 refers to the 8086 microprocessor chip which this version of CP/M works with. CP/M, by the way, stands for Control Program for Microcomputers.

Q: What are the advantages to renting a computer?

A: First, it can let you see what a particular brand is like before making a purchasing decision. "Most of our customers are in the market to buy, but don't know what kind of computer to buy, or what it can do for them," says Brett Podstata of Rent-A-Computer in San Jose, Calif. His company rents the IBM Personal



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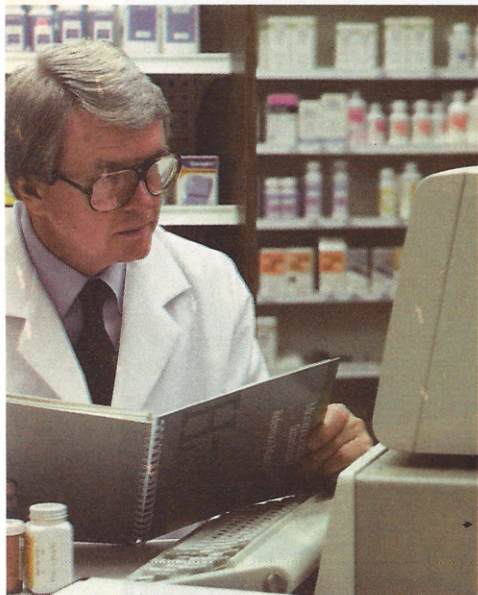
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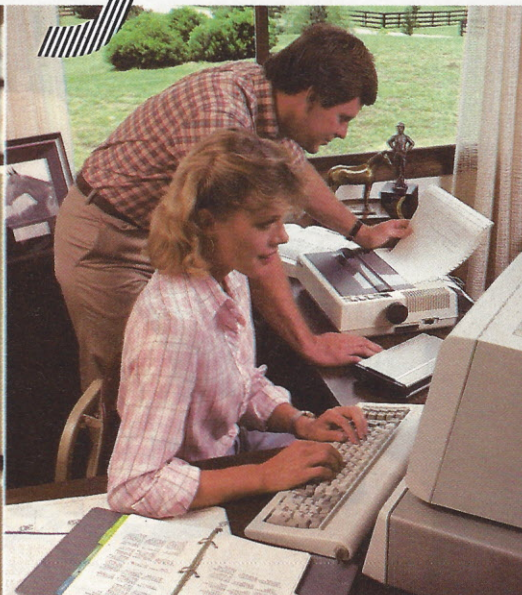
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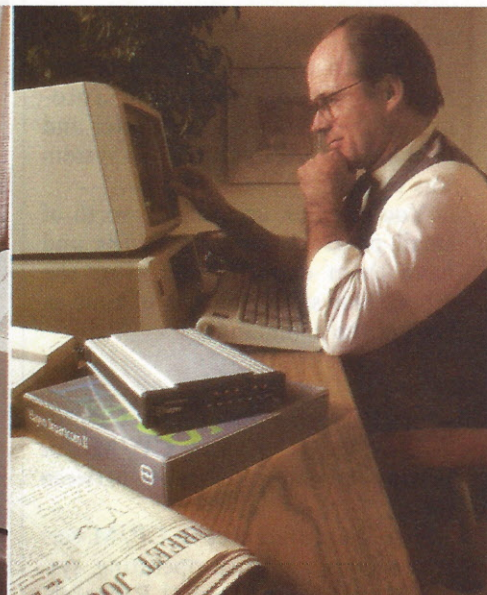
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ANSWERS

Computer (for \$200 a month), the Apple II Plus (\$139), and the Apple IIe (\$160). A customer can apply 45 percent of the rental cost toward the purchase price if he or she decides to buy.

Podstata says his company "rents to individuals, businesses and just about everybody." A lot of people rent computers for temporary uses, for example, to fill in for a big project or as a back-up when a system is in the shop.

Renting can also be a hedge against buying old technology. If you're anticipating a new product introduction in the next few months and want to wait for its availability, renting is an alternative to remaining computerless in the meantime.

Customers do have to provide their own insurance coverage, Podstata says, because "if the machine gets stolen, they're liable." But if something goes wrong with the machinery, Rent-A-Computer will fix it or swap the computer for a new one. As far as training goes, Podstata says they don't have a support staff for rentals. "Most of our customers know what they're doing and don't expect training and support," he explains.

Q: Do you think buying a service contract for my computer is worthwhile?

A: Dave McKnelly, manager of the ComputerLand store in Dover, Del., thinks so. "Would you drive your car without insurance?" says McKnelly. "That's what a service contract is. It covers the cost of repairs and labor on your system, just like an insurance policy for your car. The main reason to have it isn't because the car/computer is sure to break down, but to ensure peace of mind."

"As a strict dollars-and-cents proposition it might not pay off," McKnelly says. "Computers are pretty reliable on the whole. But computer repairmen say that many

problems arise just from user inexperience. It's not that they take all that much trouble to fix, and often it's not the machine's fault. But the result is the same—equipment downtime and owner frustration.

"Especially for a first-time user," he continues, "a service contract is reasonable."

Q: After looking at typical computer manuals—both for hardware and software—I'd like to know if there's a straightforward, non-technical way I can learn to use a computer.

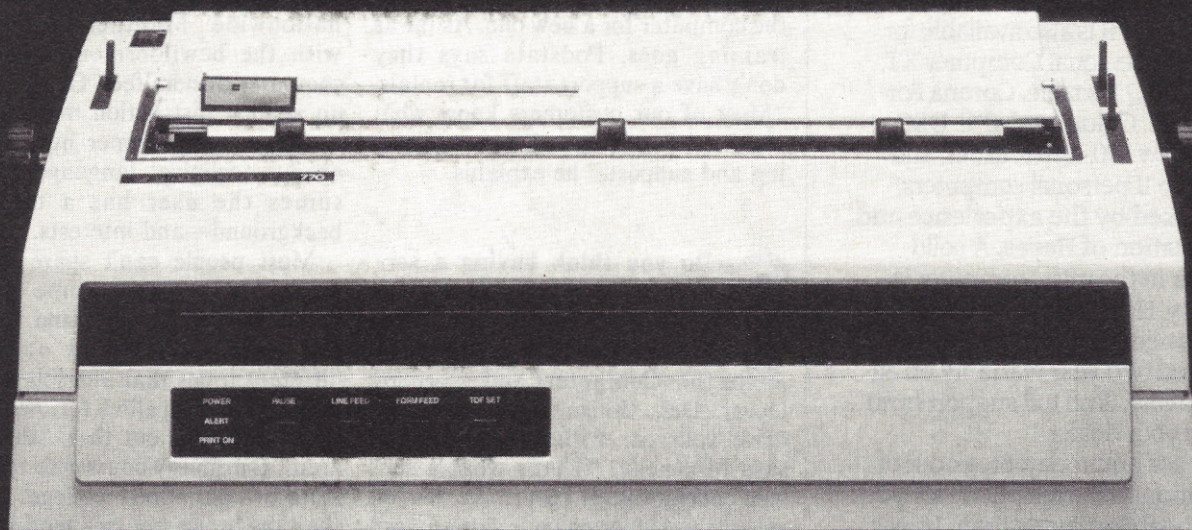
A: Howard Manthei of Farnsworth Computer Center in Aurora, Ohio, believes he has just the answer. Manthei, who was a college business instructor for 12 years, assisted Fliptrack Learning Systems (Glen Ellyn, Ill.) in developing a series of audio cassette-based instructional tapes which are now sold nationwide. Manthei sympathizes with the bewilderment many new computer owners feel. Often, they're up against instruction manuals that combine "programmer humor" with opaque technical language that assumes the user has a technical background—and interests.

Most people can't spare massive amounts of on-the-job time for computer literacy, he says, and the time they can spare often occurs at different times than the schedules of training courses allow for. Moreover, Manthei points out that, "there just aren't that many courses to take at a store or community college. And in the latter case, courses tend to be so popular only full-time students can get in." The tapes that Fliptrack produces help clear scheduling logjams. They can be used anytime at home or work—you can even listen in the car.

Fliptrack tapes cover the operation of popular personal computers and software, and Manthei says the tapes are instructionally consistent, so a

(continued on page 162)

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To avoid this confusion, type non-printable print control characters in the first few columns of the line—toggle the underline switch on and then off using `^P ^S ^P ^S`—followed immediately with the ellipses. This process will print the ellipses left justified.

To see what the text will look like before it's printed, toggle the print display with `^O ^D`.

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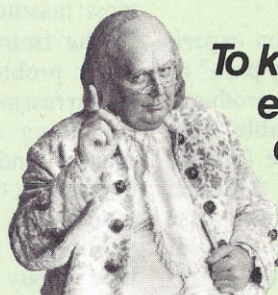
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CIRCLE 1

ANSWERS

(continued from page 159)

computer owner can rely on experiencing a familiar "learning path" as he or she learns about new products. Similar courses are available from other manufacturers in the form of instructional software, but Manthei feels that it's hard to learn how to use something when you have to do it first by simulation, then try to remember what the simulation taught as you try the real thing. With Fliptrack, the person uses the actual computer or program while learning—not a simulation. Some buyers want to do everything with software, but Manthei argues that there's a place for tapes and manuals in our new automated world. And the Fliptrack tapes tend to cost far less than

most instructional programs.

The training tapes cover several other problems Manthei has seen: embarrassment at not having read (or being able to understand) a manual, and the difficulties involved in teaching other workmates or family members how to use a computer.

Fliptrack tapes cover such topics as how to buy the right computer and software, using CP/M, and working with WordStar or VisiCalc. They cost from \$30 to \$110.

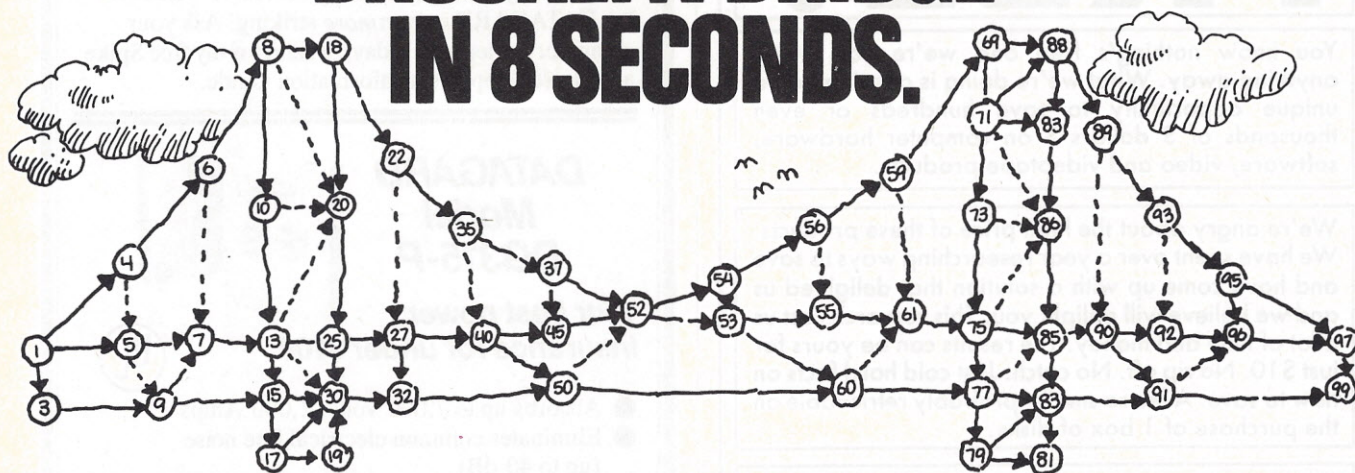
Q: I've been using Multiplan on an IBM Personal Computer, and I want to know if I can take the models I've developed and use them on my Digital Rainbow.

A: According to Drew Clausen, manager of the South Olive ComputerLand in Los Angeles, Calif., you can under most circumstances.

The file structure of MS-DOS is the same as PC-DOS. Therefore, a Rainbow running an MS-DOS application like Multiplan will be able to read the data file created on a Personal Computer under PC-DOS.

The software programs themselves will only transfer if they don't utilize any of the unique hardware characteristics of a particular computer. But most professional applications programs do this to varying degrees, so some rewriting is usually needed. This is not, generally speaking, a major task.

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Q. Are non-Apple floppy disk drives for the Apple II computers fully software-compatible with Apple's own drives?

A. Dave Graham of Sun Computers in Huntington Beach, Calif., says most of these drives work, most of the time—but not all of them, and not all of the time. Got that? The area where compatibility problems occur is in disk controller design. If you already have an Apple controller it's much less of a problem, Graham says. The trouble with other controllers occurs mainly during the program booting procedure, where the software is being loaded into RAM off the disk.

Some programs have copy protection schemes that will prevent

booting because they look at the software and stop everything unless it looks exactly like Apple's boot program. As protection schemes become more rigorous, it becomes harder and harder to avoid their stringent requirements.

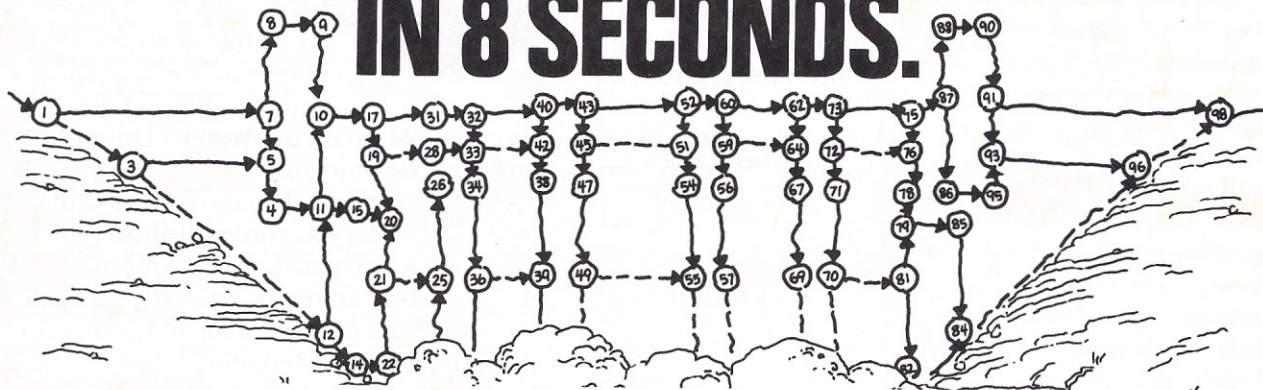
As for the drive itself, Graham says many makers use exactly the same mechanical mechanism inside the drive as Apple does, but subtle differences still may exist. Apparently Apple uses one chip (a 3470) in a way that varies from the chip manufacturer's specifications. As a result, Graham says, some software—especially Pascal-based programs—may have trouble working with a drive that doesn't emulate Apple's nonstandard use of this chip.

The worst problems arise from software that uses timing-sensitive protection schemes, since this is a timing chip. When the drive itself is off-spec, the software may still boot, unlike when you have controller compatibility problems. But it may become finicky during operation. 

CORRECTION

In our buyer's guide table of data base management systems (February 1984, page 125), we incorrectly stated that R:base from Microrim has a maximum of 400 records per file. In fact, the program has a theoretical limit of 2.6 billion files. Capacity is, of course, limited by disk space.

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CIRCLE 54

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TOSHIBA

PERSONAL PRODUCTIVITY

PERFECT WORD PROCESSOR

(continued from page 120)

and they don't need complicated formatting commands. Many will benefit now from the integrated packages like Microsoft's Windows, VisiOn, Lotus, and Context MBA, she says. Many will want word processors which have the ability to add graphics or to calculate. (She cites Samna for the IBM Personal Computer (Word II is \$450; Word III, with add-ons, is \$650), XYWrite II (\$195, from XyQuest), and WordPerfect. Some will want word processors allowing them to dash off simple letters or memos which are compatible with a secretary's more powerful system. She cites the WordPerfect and Personal WordPerfect packages as examples.

Marshak, interestingly enough, is not enamored of WordStar, nor does she believe it is the exclusive tool for executives or managers. "Microsoft Windows will allow you to put all the Microsoft software packages into it. Multiplan and Word will go in. VisiOn and Lisa inspired all these systems. They're based on Lisa philosophy. I see no reason to struggle through WordStar just because it will integrate with others. If you're used to WordStar and you're using it, fine. If you're planning to buy, don't be fooled by the numbers."

Big guns

Still, WordStar's power is undeniable in the business market. To Raish Enterprises' Kathie Krohn, it remains the standard and most sought-after package—the one by which others are judged. "Many of our clients use it in conjunction with other packages," she says. "There's a whole accounting package—TCS Accounting (TCS Software Inc., suggested price \$750-\$800 per module)—which is a fully integrated system, everything from audit entry, accounts receivable, accounts payable, general ledger, the whole bit. Many of our clients use it. There's a program on it called

'Simple.' With it, if you want to take a data file, it asks you what file you want; you can transfer it to a WordStar file. That's a tremendous asset because our clients had secretaries typing 100 envelopes a week. We just took the files and merged them with WordStar, and they got labels. They couldn't believe it. That's something not available (with most) other programs. So if you're going to integrate a system into an office, and you've got a great accounts payable system, what's the sense of it if you're still sitting there typing envelopes?"

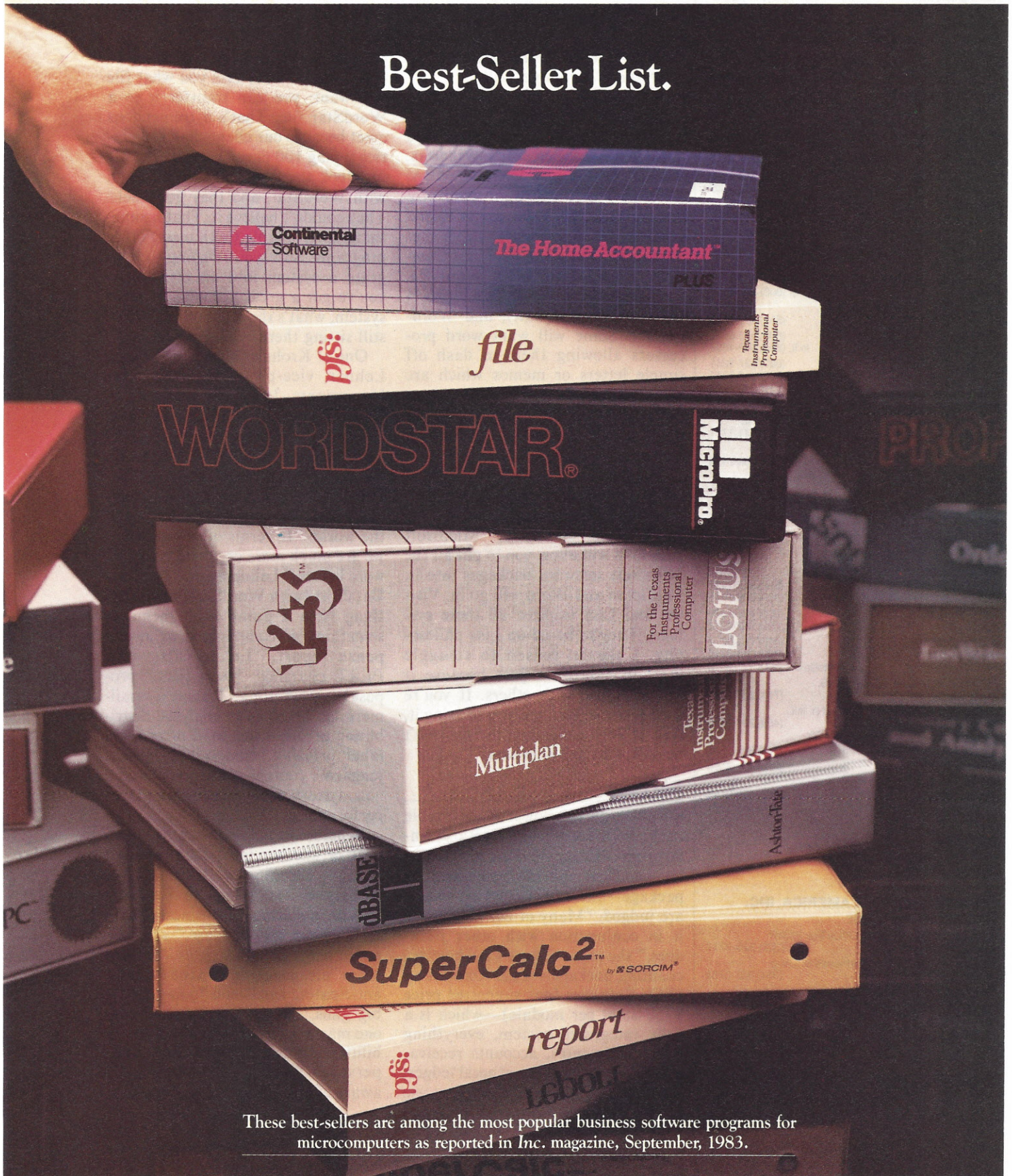
One of Krohn's "students," Danny Lehner, vice-president of Inflight Newspapers, Inc., who took one of Krohn's seminars at Raish, now uses WordStar and other Micropro packages to do just about everything in his business, which revolves around distributing and tracking some 12 million magazines to air carriers around the world. "In terms of productivity, we are much more organized than we were before," Lehner says. "I can use DataStar (with WordStar) to do anything from a dumb little memo to something as complicated as an expense report." Lehner also does PERT charting, "push lists," proposals, scheduling, Rolodex, mailmerging, break even analysis, distribution tables, direct mail promotion, label printing, customized letters, magazine content summaries, even a new system of evaluating employee performance.

Whether or not one chooses WordStar or another integrated package, though, choosing well amounts to foresight, according to Entech's Maude Ackerman. "Businesses have to do what makes sense," she says reflectively. In many cases, "making sense" means seeing into the future—anticipating needs and "going for the big guns," as she says, even though one may not understand all the possibilities and uses of the moment. "My personal feeling is"—she pauses, aware of the contradiction, "not to go

(continued on page 168)

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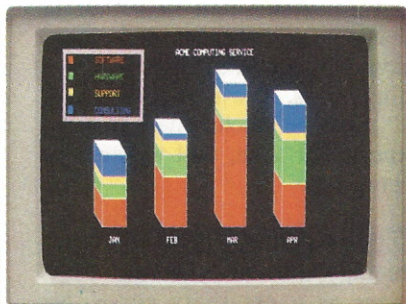


These best-sellers are among the most popular business software programs for microcomputers as reported in *Inc.* magazine, September, 1983.

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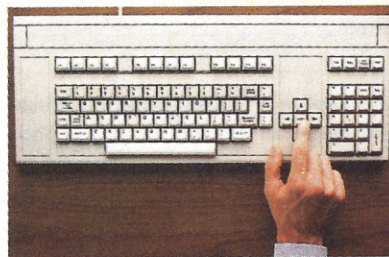
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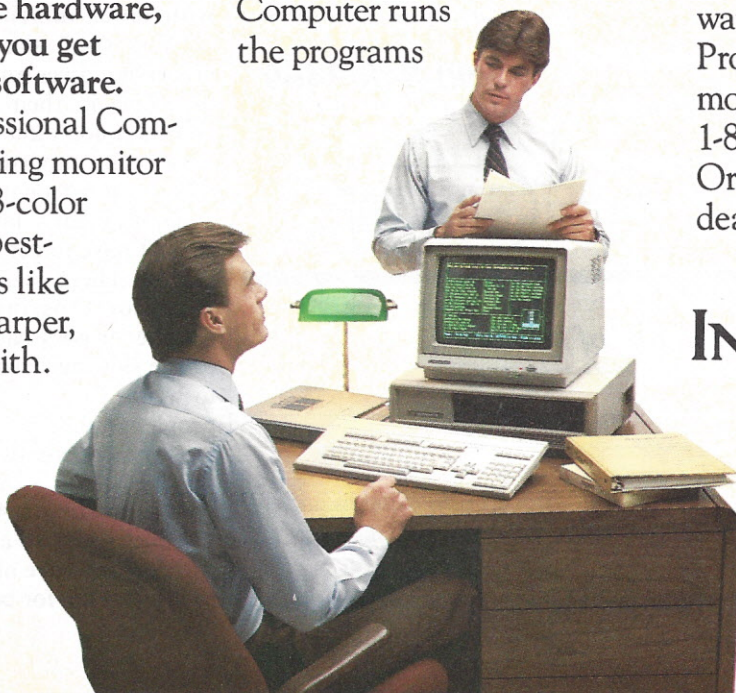
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CIRCLE 17

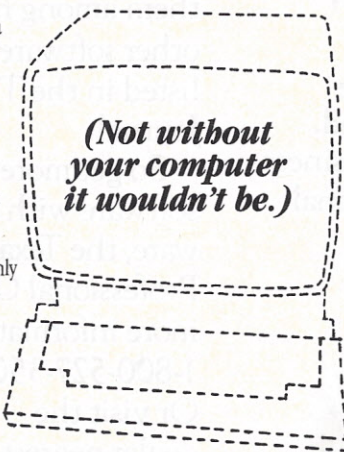
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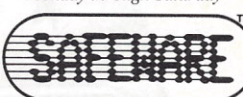


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PERSONAL PRODUCTIVITY

(continued from page 165)

for big guns, but do go for big guns. We have found, in business especially, that there is a parallel—you get what you pay for." Now or later.

Business people who look at the broad picture may need to buy a word processing package with more power than they would ever conceive of—right now. They could "grow into" that power, she suggests, going through the elementary word processing tutorials available with most packages (WordStar is an example), or seeking training—training stretched over a period of time—which would enable the manager or secretary to slowly master the "levels" of a power program. Patience is a watchword. Ackerman says that in purchasing a power program, managers have to accept that there will be a learning curve, in which "productive work" must be rescheduled in order to experiment with, and master, the new program.

More effective communication?

There may also be what she characterizes as a creativity curve. No matter what type of writing activities occur, the user may find himself writing more fluently, she argues, and with fewer inhibitions than before.

"You see," she observes, "word processing gives an added dimension to people in their creative thinking powers. I don't know whether studies have really tapped the exact reason why, but I personally feel that there's a barrier that's lost when someone doesn't have to get out pencil and paper. . . . There's no more smearing of paper or crossing out of words; whether it goes back to handwriting or the slowing down of what it takes to write, I'm not certain. But many people, from school children on up, are far more creative and fluent when they're behind a computer."

Whether or not Ackerman is right, she does speak to a creative mystery which many have also intuited. Word processors do, for better or worse, af-



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CIRCLE 8

fect the way we write. No one has articulated how, exactly, a processor complements the writer, or whether it may in fact defeat him at times. No one knows exactly how, but both phenomena have been known to occur.

There may even be a strong argument for the fact that while word processors help many writers in removing barriers to expression, they may actually disturb the thought process of some others, making it entirely too easy to wipe out a sentence or thought. Think of it: Something changes in the act of writing when words are no longer imprinted on paper. The power of that processor to instantaneously record a thought, and to wipe it out, without a trace, suddenly has made the echo of the "incongruous," or out-of-joint thought more faint—perhaps more easily forgotten. Suddenly we are able to "process text," but not necessarily to preserve our rough drafts. There is something nagging about rough drafts; they contain more evidence of our intelligence than we give them credit for.

For businessmen, as well as creative writers, the same question may apply: Is the best idea the one that was just eliminated?

No 19th, or even early 20th century man or woman needed to worry about that. Writing was an act deeply felt by the hand, holding the pen, or clacking away on the typewriter keyboard. It meant a commitment; there was always the rough draft; always something to look back to. The hard evidence of thought, the evolution, the uncomfortable incongruities that might later—15 drafts later—come swinging back in the mind as a brilliance, an inspiration as though out of nowhere, was our comfort, our reward. Today, unless we use word processors carefully, we can wipe out that evidence at the touch of a control or function key. These keys must be used thoughtfully and carefully, or we may lose more than we have gained.



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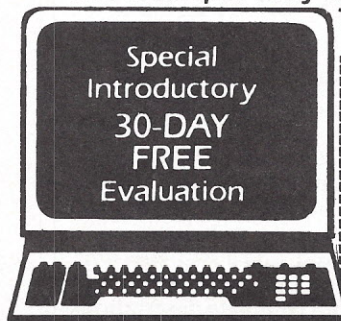
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CIRCLE 43

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Books That Fit The Bill Or Miss The Mark

■ All About 1-2-3 ■ Introducing IBM PCjr

What To Do When You Get It Home

ALL ABOUT 1-2-3

ROBERT SCHWARE
AND ALICE TREMBOUR
DILITHIUM PRESS
BEAVERTON, OR
128 pp., \$9.95

Lotus Development Corp.'s 1-2-3 is probably the best-selling software for the IBM Personal Computer and other MS-DOS computers. Its popularity is based on its integration of three of the most widely used business programs—an electronic worksheet, a graph and chart generator, and a data-base manager—into a single package, eliminating the need to swap program and data disks or to learn new commands just to turn a worksheet into a graph.

This popularity, combined with the denseness of the manuals that come with the program (characteristic of the computer world in general), has spawned a need for supplementary books that help explain how to get the most from it. As Robert Schware and Alice Trembour point out, "It's been said that software companies fuel computer book production and demand by providing inadequate or unusable documentation. (After all, why did we write this book, and why did you buy it?)"

Why indeed? *All About 1-2-3* is not the book that its title implies. Far from being a supplemental manual for Lotus 1-2-3, it is instead a good general introduction to the most popular business uses of personal computers—electronic worksheets, graphs, data base management, and word processing. This is not very helpful to the person who has already gone out and invested in a personal computer and Lotus 1-2-3. Rather, it is a very good research source for the person who has heard about 1-2-3 and is trying to decide if it's the best program for his particular needs.

The book begins with a chapter on personal computers and how they can make many difficult jobs easier for business people, comparing what can be done with the personal computer to what can be done with a time-sharing mainframe, and what can be done with no computer at all. It then goes into how these business functions can be aided by programs like 1-2-3.

Lotus 1-2-3 is primarily a large electronic worksheet (or spreadsheet) program that incorporates many features that are missing from the early worksheet programs. Principal among these is the ability to search through the worksheet to find entries that match the search specification, and to sort a specified group of entries and redisplay them in alphabetical or numerical order—very useful

features when trying to make sense of large groups of figures. These two features are referred to as the "data base management" portion of 1-2-3.

The authors then include a long and useful section on the uses of word processing and graphics. I did find it rather disturbing that the section that describes the joys of proofreading programs contained more than one typographical error. I also found it interesting that the best illustrations in the section on graphics were courtesy of Apple Computer, Inc.—on whose computers Lotus 1-2-3 will not run.

The most interesting chapter in the book presents a comparison of Lotus 1-2-3, Context MBA, and other non-integrated worksheet programs like VisiCalc, Multiplan, and SuperCalc. At times it seemed that, with the exception of the 13-to-one speed advantage of 1-2-3, the authors favored Context MBA. Many of the favorable points of 1-2-3 were also listed as its disadvantages. For example, its multiple on-line Help screens are called part of its "user-friendliness," but are also considered a disadvantage because it's also easy to get bogged down in them. The "macro" facility (the ability to replace often-used sequences of many keystrokes with a much smaller number of keystrokes) is often referred to as one of the most powerful features of 1-2-3, but very little is said about what

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macros are and how they work. The definition of a macro as "an instruction that leads to performance of a frequently used procedure" really doesn't help.

There are two appendices that relate specifically to Lotus 1-2-3 (assuming that you bought the book to go along with the program). These tell you how to fill out the warranty card, copy the disks, and do a minimal system configuration. One would think that this information would also be in the first chapter of the 1-2-3 manual itself, but given the repeated criticisms of the manual by the authors, perhaps there really is a need to present this information here as well.

As a technical manual or an aid in learning to use Lotus 1-2-3, *All About 1-2-3* is not very useful. But as an introduction to the business uses of personal computers, this book can help you decide if 1-2-3 is the program for you.

—Orlan Cannon

Bringing Up Baby

INTRODUCING IBM PCJR
DOUGLAS FORD COBB AND
CHRIS DEVONEY
QUE CORPORATION
INDIANAPOLIS, IN
245 pp., \$9.95

In November 1983, IBM announced the entry of PCjr into the home computer market. Many people expected that this new computer would immediately enjoy the incredible successes of its predecessors, the IBM Personal Computer and XT. The announcement itself was almost an anticlimax to the frenzy of pre-announcement rumors that had people putting in orders for the new computer sight unseen, and analysts predicting the demise of nearly all non-IBM computers.

The frenzy also spread to book publishers, who wanted to jump on this bandwagon of free publicity. A few short months after the announcement (before IBM had even begun shipping any PCjrs), we have the first results in the bookstores.

One of the more comprehensive and yet easy-to-read books on the IBM PCjr is *Introducing IBM PCjr* by Douglas Ford Cobb and Chris DeVoney. The authors write for the complete novice thinking of getting his feet wet in the personal computer waters with a PCjr purchase, yet try to cover nearly every aspect of personal computer use.

The book's introduction takes the reader into the home of an imaginary family that has just discovered all the useful things they can do with the new PCjr. If the members of the family actually did all the things described in this chapter, they'd be standing in line all night to use the computer; however, the examples are helpful for someone who has never used a computer before.

The PCjr is then examined in depth, with long looks at what you get for your money. For those hardy souls who want to know how to interact with the PCjr at the lowest levels, there is an introduction to PC-DOS 2.1 (the PCjr's operating system), and a comparison of the different languages available for programming the machine. These sections will be of use mostly to people who already have an IBM Personal Computer or XT and want to know how compatible the PCjr will be with their present system, or to people who are familiar with other computers and want to see how the PCjr compares.

Most important, the authors list all the software (mostly games and most just for the enhanced version) sold especially for the PCjr. After all, without the software, the machine is just a plastic box with a keyboard. The lengthy descriptions of the programs, what additional equipment they require, and what to expect from

them, are invaluable to any potential PCjr buyer.

Throughout the book, the authors take the role of unabashed cheerleaders for the PCjr, assuring the reader that the choice of the PCjr is, of course, the only right one in the long run. So the comparison of the PCjr to other home computers at the end of the book is fairly predictable, though the reader's interest is maintained by a number of strange contradictions generated there. For example, after predicting that the PCjr will hurt sales for everything from Commodores to Vector Graphic machines, the authors state that "nearly every other company in the industry will gain as a result of the high prices IBM is charging for the PCjr. PCjr's base price is two or three times higher than the base price of competitive machines."

On the current lack of software for the PCjr the authors say: "As many Apple II users exchange their old machines for PCjrs, the demand for popular Apple programs for PCjr will rise" (why trash their Apples in the first place?), and "... for example, there is no cookbook program available today for PCjr, so it is likely one will be developed." No one can say that the authors lack confidence in the PCjr.

For those planners-ahead who worry about expanding their PCjrs, the authors provide the assurance that, despite IBM's statements to the contrary, the PCjr will be expandable. "Making PCjr unexpandable would be a terrible marketing mistake, and IBM doesn't make marketing mistakes." (It's good to know that perfection hasn't gone out of style.) On the other hand, if you're thinking of expanding, "... you're likely to spend less on the IBM PC or XT than on a comparably equipped PCjr."

If you're seriously considering a PCjr, check out this book. The section on software availability alone is worth the price.

—Orlan Cannon



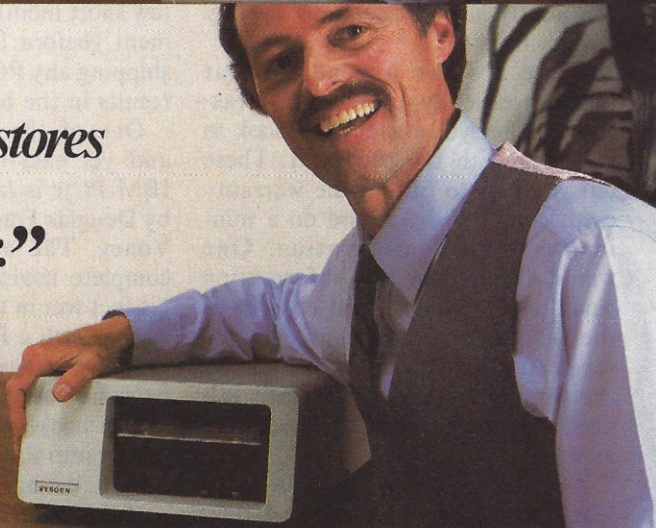
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SYSTEMS

ZENITH Z-100S

Zenith Data Systems has recently announced the Z-100 series of IBM-compatible personal computers.

The Z-100 series is available in two basic configurations—the Z-150 desk-top models, and the Z-160 portables. There are three Z-150 models, and two Z-160 models. All five systems have 128k of RAM expandable to 640k, two RS-232-C serial ports, one parallel port, RGB color output, an IBM expansion bus, and a detached keyboard. When fully configured, all have four additional slots for expansion. Desk-top models also provide “grey-scale” monochrome output. Monitors are not included with the desk-top models, but the portables have built-in monitors.

Zenith Data Systems president Donald P. Moffet says, “To date, we have successfully tested more than 175 software programs written for the IBM Personal Computer, and dozens of plug-in boards as well. We ran them right out of the box—without any modification.”

Software compatibility is possible because the Z-100 series uses an Intel 8088 processor, the same as that used on the IBM, and uses the MS-DOS operating system. In addition to the

already existing IBM-compatible software that runs on the Z-100s, Zenith plans to sell a family of Zenith software for the Z-100s.

The Z-100 series is expansion board compatible with the IBM Personal Computer. Randall E. Griffin, ZDS vice-president of product management and planning, says several hardware features make the Z-100 systems easy and convenient to use.

“Our keyboard has an enlarged L-shaped Return key, and a double-width Shift key located where it should be. The backslash key has been removed,” says Griffin. “We have added LEDs to signal when the keyboard or numeric keypad is shifted. Another nice feature is the electronic ‘key click’ that tells you when a key is repeating. The auto-repeat feature speeds up when a key is held down, expediting cursor movement.”

Griffin says Zenith also has some special features for the video display system. “In addition to normal scrolling mode, there is a smooth scroll mode that can be used with any program to reduce eye strain and make general viewing easier.”

The Z-100 models have power-up diagnostics, and an automatic boot capability that lets you boot an operating system from any disk.

The three Z-150 desk-top models vary in their data storage devices. One system includes a single floppy drive, another has two floppy drives, and the third has one floppy drive and one 10.6Mbyte Winchester hard disk drive. Retail prices are \$2699, \$3099, and \$4799 respectively.

The two portable Z-160 models, both with built-in 9” amber monitors, have suggested retail prices of \$2799 for the single floppy drive version and \$3199 for the dual floppy drive version.

The Z-100s will be sold through the ZDS network of 23 U.S. and Canadian wholesale distributors, and through more than 950 retail outlets in North America. Desk-top models are available now, and ZDS plans to ship portable models in May.

FOR MORE INFORMATION: ZENITH DATA SYSTEMS, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-8744.

Colby PC-3

Fitting under an airline seat, the Colby PC-3 transportable is a stand-alone IBM-compatible system. Weighing 26 pounds, the unit features a full-width carrying handle that doubles as a tilt stand. The Colby PC-3 comes standard with 128k of RAM and can be upgraded to one Mbyte on the motherboard. It has two 360k floppy drives, a 9” monitor, a serial port, a parallel port, and a hard disk interface.

\$2795

Colby Computer

849 Independence Ave.

Mountain View, CA 94043

(415) 968-1410

retail

Execuport XL

Execuport XL+

With its Z-80 processor, the Execuport XL can run CP/M software, and it has 80k of memory. The XL+ adds the Intel 80186 16-bit processor, so it can run CP/M, MS-DOS, and CP/M-86 software. Both models feature a 9” by 5” green phosphor screen which can display up to 132 columns by 24 lines, and dual double-sided, double-density 5¼” floppy drives with 800k of formatted storage apiece.

\$2695 (Execuport XL)

\$3495 (Execuport XL+)

Computer Transceiver Systems, Inc.

P.O. Box 15

E. 66 Midland Ave.

Paramus, NJ 07652

(201) 261-6800

retail

PERIPHERALS

ThinPrint 80

Axonix Corporation has announced the ThinPrint 80, a battery-operated thermal graphics printer that weighs four pounds and fits in less than one-half the space of a standard briefcase. Measurements are 2½” by 7½” by 11½”.

Featuring 40-character-per-second bidirectional printing, the ThinPrint 80 has a 2048-character buffer memory and will print 80 or 136



Pictured here with a monitor, this Z-150 model has two floppy drives.

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Tally

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characters per line. It supports serial or parallel interfaces, and will do single sheet or roll feeding from its internal paper compartment, which holds 80 pages of 8½"-wide paper.

Axonix says the ThinPrint 80 provides the highest graphics resolution available in a battery-powered printer. A dot-addressable resolution of 960 by 7 dots per line, or 120 dots per inch, creates facsimile-like images of graphs, charts, and digitized pictures.

At a suggested retail price of \$279, the ThinPrint 80 includes rechargeable batteries, an AC adapter, and one roll of paper.

FOR MORE INFORMATION: AXONIX CORPORATION, 417 Wakerua Way, Salt Lake City, UT 84108; (801) 582-9271.

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The 1770 ink-jet color printer features switch-selectable unidirectional and bidirectional printing. It can integrate text and graphics on cut-sheet or roll paper in seven colors.

\$1250

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880 Apollo St.

El Segundo, CA 90245

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BITS & PIECES

GESP-753

The microwave products department of General Electric Co. has introduced the GESP-753 voltage spike protector with built-in noise filtering capabilities. The GESP-753 is designed to protect personal computers and other electric devices from sharp spikes in electrical voltage, such as those occurring during electrical storms.

Steve O'Neill, marketing manager for this department of General Electric, says the GESP-753

"becomes more important with each advancement we see in technology and each new piece of solid state equipment we move into our homes and offices."

The GESP-753 plugs into the upper outlet of any wall grounding receptacle. A stabilizing pin fits into the grounding contact of the unused outlet to hold the unit in place. Once plugged in, a built-in light indicates that protection circuits are working. There are three grounded outlets on the device for plugging in equipment.

GE says voltage transients, or spikes, are common on AC power lines. "We know spikes are going to happen every day," O'Neill says. "Utility transformers step up power to meet load needs, a storm goes through, heating and cooling equipment switches on and off . . . it's far from unusual," he comments.

O'Neill adds, "The GESP-753 is insurance against what is almost inevitable. It's a low-cost way to protect high-cost investments." The GESP-753 carries a suggested retail price of \$48.75.

FOR MORE INFORMATION: GENERAL ELECTRIC CO., 316 East 9th St., Owensboro, KY 42301; (502) 685-6200.

Datable

This desktop computer stand fits your computer on a desk or table to allow more room for peripherals and software. The Datable positions the monitor at eye level and conceals cords and other paraphernalia.

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Micro Saver

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retail

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BUSINESS

DOCUMAX

Are your files getting out of hand? Your disks overflowing from the cabinet? Then an information management system like Documax from Signum Microsystems may be just the prescription for what ails you.

Documax, which runs on the Apple II series and Apple III in emulation mode, is a document-handling system designed for those who manage word processing, electronic mail, and other files of textual information. The program acts as an electronic file cabinet that combines the functions of accessing, organizing, and storing documents.

Documax features nine functions for managing your text files. The Search function lets you search through the full contents of the files for a phrase of up to 30 characters at 15,000 words per minute—searching a full disk in less than 90 seconds. Files can be scanned quickly with the Inspect option, allowing you to look at the first page of any 12 files, pausing at a file to read the contents by scrolling backward or forward if you wish.

For more efficient storage of files, the program's Compress feature uses a text compression scheme which effectively doubles the capacity of any disk by reducing files to less than half their original form.

Compressed files can be restored to original form using the program's Recover function.

Documax's other features include a Sort option that will organize file directories into as many as 10 subgroups and organize those subgroups alphabetically. The Transfer function lets you move files from one disk to another; Delete allows you to remove unwanted files; and Rename permits you to change file names. With the Directory function, you can list the file names on any disk, the number of files, and the free space available.

The program also can read electronic mail files and information files from data base services such as The Source or Dow Jones News Retrieval, and can print any portion of stored documents. A printer and a second disk drive are recommended. Documax retails for \$175.

FOR MORE INFORMATION: SIGNUM MICROSYSTEMS, 120 Mountain Ave., Bloomfield, CT 06002; (203) 726-1911.

Docuwriter

Docuwriter is a word processing program that features upper- and lowercase display, editing and merging operations, a mailing list manager, and a form letter element.

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CIRCLE 42

(continued on page 186)



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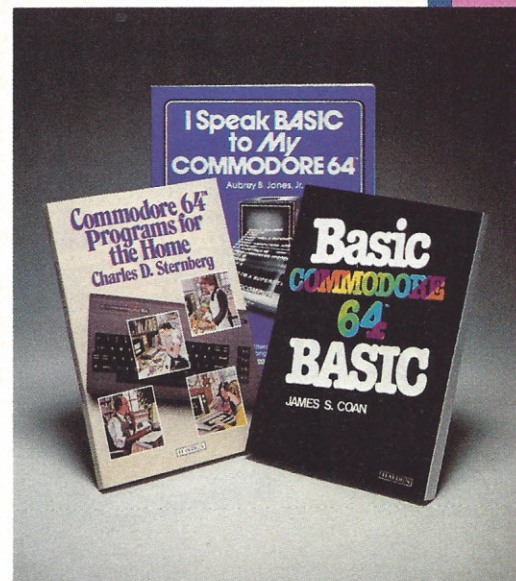
(Jones) Acclaimed in classrooms and computer literacy courses nationwide, home users will also find this text an effective introduction to programming on the Commodore 64. The detailed lessons focus on learning objectives, definitions of key terms, programming exercises and more. #6172, \$9.75

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(Glentop Publishers Ltd.) This is the exciting story of Dr W and his comrades. They've been stranded on a derelict spaceship. Their only hope of escape—learn to operate the ship's computer, a Commodore 64.

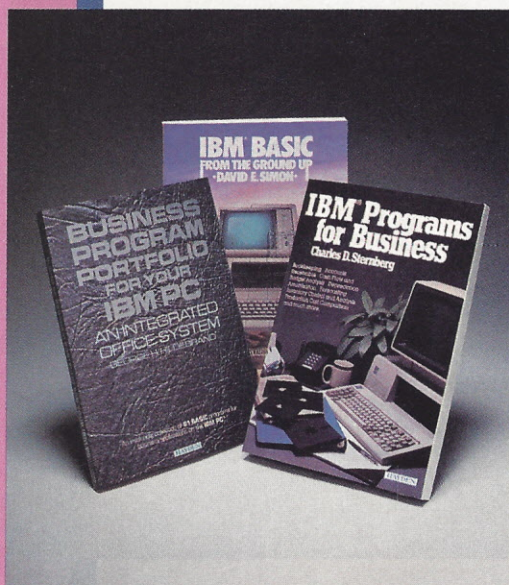
This imaginative storyline is an effective way to teach your child all about the Commodore 64—mastering commands/functions, and programming in BASIC. As the crew learns, your child learns. #7635, \$24.95.

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Qwerty's Alphabet Adventure Qwerty's Number Adventure

(Shadow Lawn Press)
Meet Qwerty, a fun-loving caterpillar who guides children on an exciting journey through numbers and letters. Qwerty will keep children entranced for hours as they learn their ABC's and number concepts. Available as book/software package only, containing 1 cassette (Apple™ version on disk) plus documentation, **\$14.95 each.**

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Atari® in Wonderland The Atari® Playground

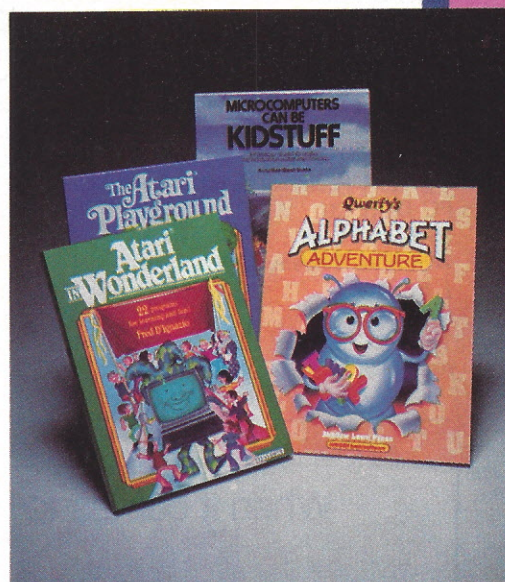
(D'Ignazio) Imaginative and unique ways to teach computing to youngsters. Wonderland has 22 programs centered around stories that are also exciting learning experiences. Playground contains 23 programs that let children participate—spelling bees, chasing wild letters, watching ghosts appear and disappear, and more. Instructions are so simple, children can use these guides on their own.

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(continued from page 180)

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EDUCATION

STORY TREE, AGENT USA, SPELLDIVER, AND BANNERCATCH

Four new educational programs for young people have been added to the Wizware software line from Scholastic, Inc. The new programs, designed to incorporate fun with learning, include Story Tree, Agent USA, Spelldiver, and Bannercatch. Spelldiver is aimed at children ages 6 and up; the other three packages are recommended for ages 9 and up.

Story Tree lets children write stories that "branch out" (like trees), giving the reader several story paths to follow and many possible conclusions. The child can write

interactive stories which branch out in three ways: continuing directly to another page, branching by choice according to the options the writer provides, or branching by chance.

Agent USA is structured around the train stations of over 100 different U.S. cities as part of a cross-country train chase designed to help children learn geography. The train chase involves the pursuit of an evil character called the FuzzBomb. In addition to planning their travel route by creating a map showing the rail lines connecting the cities, children must be on time for train departures and stay informed about the status of the FuzzBomb.

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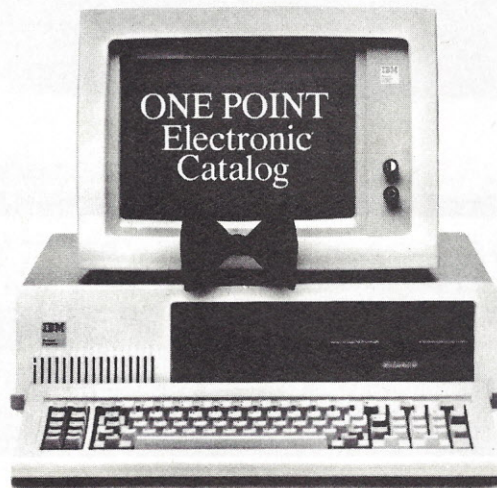


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CIRCLE 41

PRODUCTS

out which trains will connect him to where he needs to go.

Spelldiver uses the fantasy environment of an ocean floor to help children learn to visualize letters and words. The child assumes the role of a deep sea diver exploring underwater mystery words on the ocean floor. The letters are covered by a strange seaweed called "lettermoss."

The monitor screen serves as a window, allowing the diver to see only part of each letter as he removes the moss. The challenge is to uncover and decipher as many letters as possible, and to guess the word without running out of air or being attacked by sharks, flipper-nippers, and other sea creatures. The program comes with a list containing thousands of words.

Bannercatch is a five-level game of strategy and skill that helps children learn to collaborate to play against a team of clever robots, while introducing the conversion of binary numbers to their decimal equivalents. Working in teams of two, each player controls two humanoid robots attempting to defeat Max, the guardian of the Galactic Tollway.

The humanoid robots in Bannercatch must cross a simulated playing field from "home" territory as they attempt to capture a flag concealed by Max's robots. At the same time, they must defend their own flag against Max's attempts to capture it. Max's robots communicate with each other using a decodable binary language which can be deciphered by converting binary numbers to the decimal system.

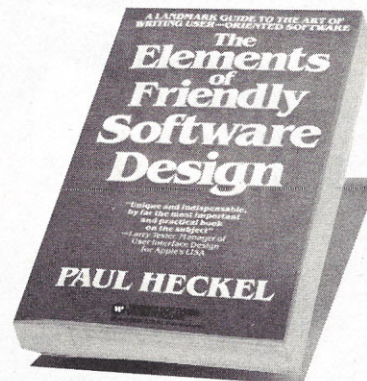
Story Tree runs on the Apple II series with at least 48k and retails for \$39.95. Agent USA, Spelldiver, and Bannercatch sell for \$29.95 each and run on the Apple II series, all Atari models, the Commodore 64, and the IBM PCjr.

FOR MORE INFORMATION:
SCHOLASTIC, INC., 730 Broadway, New York, NY 10003; (212) 505-3000

Montana Reading Program
Designed to provide word-recognition skills, this program uses color graphics

(continued on page 192)

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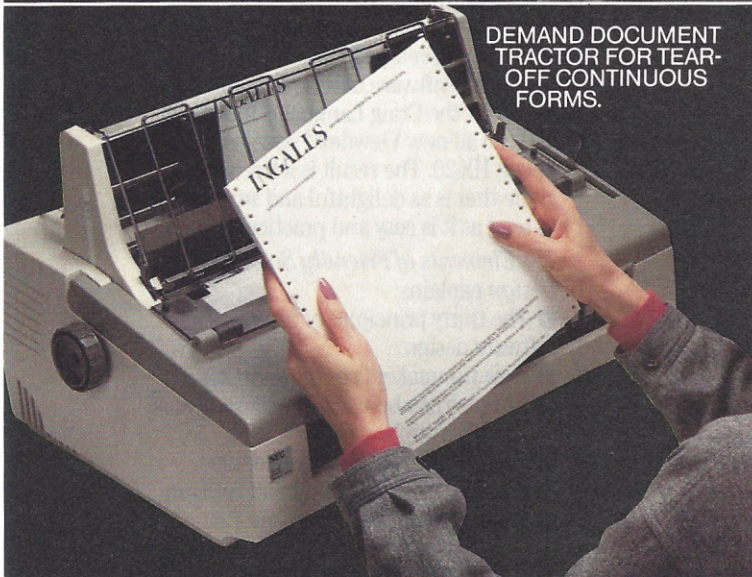
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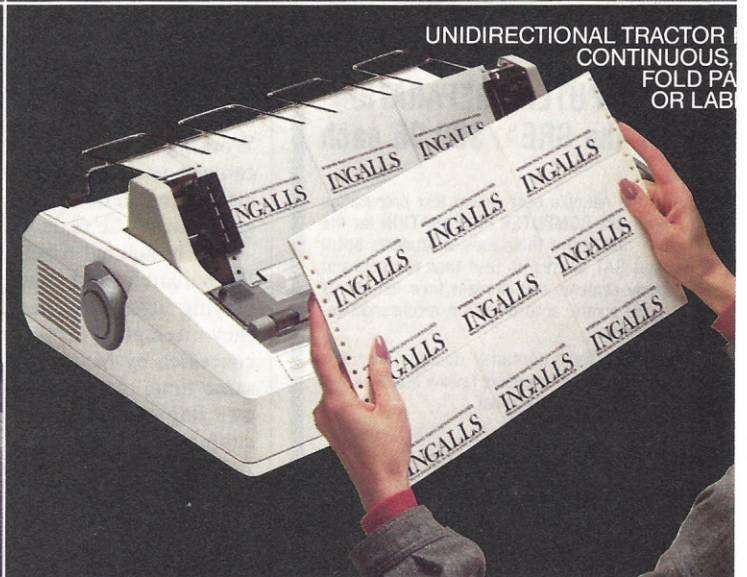
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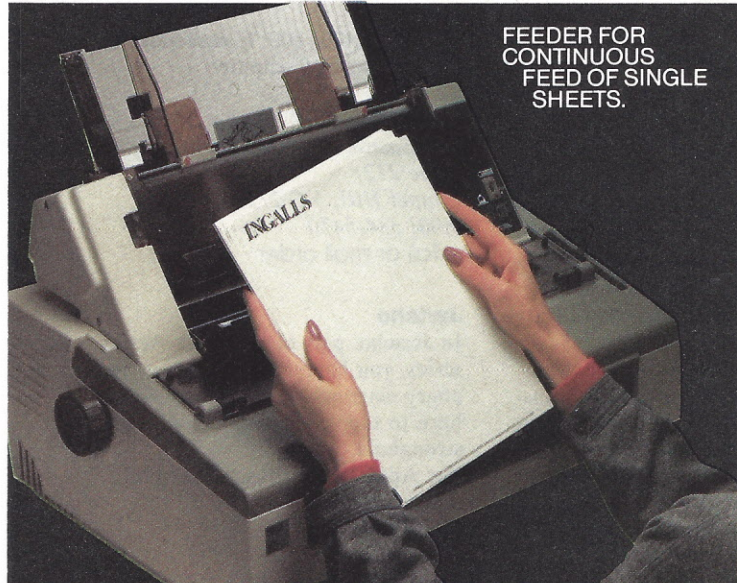


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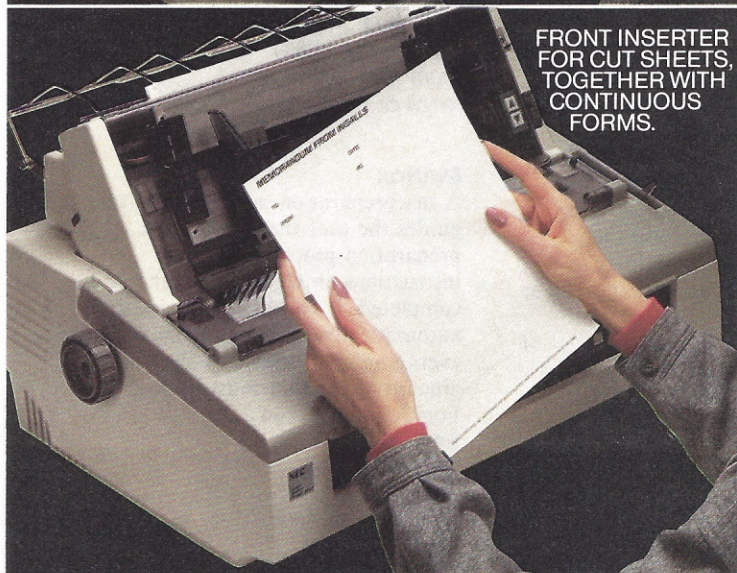


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(continued from page 189)

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Bill Gates On The Dynamic Future Of The Software Industry

What do the operating system for the IBM Personal Computer and its many imitators, the BASIC programming language, and Apple's Macintosh all have in common? Answer: Bill Gates. The energetic chairman and CEO of Microsoft was intimately involved in the development of each. Although Microsoft is known primarily as the source of the PC-DOS operating system for the IBM Personal Computer and the various versions of MS-DOS used on all PC-clones, the Bellevue, Wash., firm is staking its future on applications software. Initial offerings such as the Multiplan spreadsheet are found on computers from the Radio Shack Model 100 to Macintosh. In a recent interview, Personal Computing asked Gates his opinions on the future of software for personal computing. His answers are excerpted here.

What are some of your thoughts on how software for personal computers will evolve?

Gates: The next step is integrated use of data bases. Currently, programs keep track of information under simple names. What we need is to be able to ask meaningful questions. Then the data base becomes the natural metaphor for personal computing.

This is the natural way to use a computer. Turn it on and ask for data. This data-base capability will be part of the operating system, but we are quite a ways away.

Spreadsheets are the most extensively used business tools to date, closely followed by word-processing and data-base software. How will spreadsheet use grow?

Gates: I think it is generally accepted—although no one has come

out with a product (that goes beyond spreadsheets)—that a spreadsheet with formulas is not the ideal metaphor for how we store and manipulate information. People think in a database approach. Yet no one has done a data base that has the immediacy and quickness that just playing around with little cells on a spreadsheet has today.

So, I think you will see the data



Photographs by Doug Wilson/Black Star

base rise and the spreadsheet fall as the central metaphor over time. There is no question that the spreadsheet is the primary one today.

Spreadsheets, although they are used as what-if tools, aren't really designed as such. Certainly, they don't parallel the way many managers think. Many people set goals and figure out how to achieve these goals, while with spreadsheets you fill in

numbers and see what bottom line you come out with. For many people, that's doing it backwards.

Gates: Most often, spreadsheets are used as a form; they're just a nice way of doing reports. You put the data in the spreadsheet and then you build the report around the data. When the data changes, you can just go in and nicely recompute the averages and totals. What-if calculations aren't the primary use for spreadsheets. If it were, you'd see a lot more iteration and backward solving and more powerful techniques for decision analysis.

Often, the spreadsheet becomes the only application the user is familiar with, so he uses it for all his record keeping and report handling and things that you might not normally use a spreadsheet for if you knew the programs that were specifically designed for each job.

Do you foresee any really exciting changes for the end user in terms of application software?

Gates: Dynamic software is one exciting concept that clearly will become extremely important. Here, your applications software learns how you work, what you do, internalizes that, and saves you work.

For example, let's say you regularly create reports that require a lengthy job of sorting data. When you have done the work once, you don't want to have to repeat it over and over. Ideally, you'd like to be able to tell the software: "OK, do the same thing, only this time include the European divisions and throw in a pie chart." This is what dynamic software would do. It would learn your work patterns and adapt to them. We have a trivial form of that capability in keyboard macros—the ability to

store multiple keystrokes under one instruction but dynamic software would be much more sophisticated. This software would be able to build user profiles from your history of using the computer.

How far are we from truly dynamic software?

Gates: We're over a year away.

Is dynamic software a form of artificial intelligence?

Gates: Yes, but I don't like to use the term artificial intelligence.

Why not?

Gates: Because the term artificial intelligence implies blue sky, futuristic ideas. This isn't blue sky. We have prototypes.

What are you doing to improve today's software?

Gates: We're trying to be scientific in evaluating how users interact with applications programs. An example is studies we're doing with Microsoft Word, our word processing program. Word is an interesting example because it has so much power, so many capabilities that—even though it is easy to use—the number of options can be intimidating to some users. So we're testing Word by actually recording on disk how some users interact with the program. We see when they use the mouse, how they interact with the menus, when they grow into using more commands and functions.

Basic things like organization of the manual are important. We'll incorporate improvements we've learned in part from this study in our next release of Word.

Even as recently as a year ago industry pundits said that there was a basic tradeoff: Software was either easy to use or it was powerful. Is that no longer valid?

Gates: There is no trade-off like that. It is no harder to drive a fast car than it is to drive a slow car. In fact, often the power of the machine is used to create an easy-to-use interface. All the stuff we are doing in graphics, for example, requires the machine to move a lot of bits around. Humans

are very effective at seeing and absorbing a lot of graphic information very, very quickly. We can put such a rich image up on the screen that you can learn very quickly what kind of sales you have through a graph, for instance. Yet it is much harder for the personal computer to drive the bit-mapped screen than it was to just pump characters out on the teletype. So, we are using power for ease of use.

The only time you get into the trade-off is not in the design of the machine, but in software packages. If you provide a lot of options, you're going to scare the end user. You might try to argue that the user doesn't have to use every option so it shouldn't bother him, but it *does*. The fact that the menu has 20 entries

“With software, there will always be a trade-off between what the advanced user and the neophyte want.”

is intimidating because users don't know when to stop learning. They wonder if they have to use another feature, or feel that they have to learn about more features, even if they don't really need them to get something out of the package. In software packages you can talk about the ratio of power to simplicity; clever software design improves that ratio. That is, clever design allows you to make better trade-offs between power and simplicity. Features such as graphics and menus are allowing us to improve that ratio.

But at the software level, there will always be a trade-off between what the most hard-core users will want to do and what is needed for the neophyte in the first hour of use.

Is Apple's Macintosh a true breakthrough in personal computing?

Gates: Macintosh is very innovative. Our promise to make personal computing truly accessible to the masses is not yet fulfilled, but Mac heralds the next step. Microsoft was heavily involved for some time in Macintosh. **You mentioned networking. Is networking here now or is it around the corner?**

Gates: It is definitely around the corner. One of our key products is our operating systems, MS-DOS and Xenix. We are at this stage a bottleneck for networking.

In terms of the standard ways that operating software gets extended for things like record locking (security measures to prevent unwanted users from tampering with files on multi-user or networked systems), file modes, and temporary files—all that substructure to implement networking is not yet released (that is, no version of MS-DOS that is commercially available yet has those capabilities). So, I think when we get all those pieces in place by working with our OEMs (original equipment manufacturers), you'll see an explosion in the use of networking.

When will networking arrive?

Gates: 1984 will be a big year for networking, but it is not here today. What you have now is some independent companies that have done some software extensions. The main function right now is disk sharing, because you don't have any specialized applications for networking, not even data bases that can let you share data bases across the network.

Networking brings up a philosophical question where forces inside corporations are trying to revive centralized purchasing, trying to regain control of computers and turn the trend back to institutional, corporate computing instead of personal computing.

Gates: I don't know about the politics of who buys computers, but one of the biggest uses for computers is to share

information. My primary use of my computer is to look at shared data bases about customer activities, schedules—I use electronic mail more than anything, sending messages to people, asking them about their trip to Apple, keeping them up to date. I send on the order of 300 messages a day, and I receive about an equal number back. That makes that machine very useful.

The amount of time I spend using a spreadsheet is much, much less, and I think you'll see the benefits of the machine being much greater. There will be this drive towards penetration that you have never seen before. Right now, the computers are isolated. You can always borrow someone else's, so if an individual doesn't have his own machine, it's not that big a deal. But as soon as we got electronic mail we had to make a commitment to get *everybody* on. If we left someone off, they became a second-class citizen.

Electronic mail is an obvious benefit. But one of the reasons that personal computing, the concept, caught hold was that people were unhappy with information in the central data base and wanted to be able to do things themselves.

Gates: No, no. They weren't unhappy with the information in the central data base, they were unhappy with how they had to go about *getting* the information; about having to go to the central DP department, getting a special application written, and then having huge printouts show up on their desk in some crazy format, in these huge binders every month, and the data is already 30 days out of date and it isn't really digested in a format that is useable for them. It's not interactive; they can't look at it and say, what about this, what about that, hmm, let's look into this more. It was just a lot of paper sitting on their desk.

Sending a wire down into the computer room to allow them to get that data rapidly and easily doesn't mean



“Every year . . . more people are making effective use of personal computers.”

that we are turning back to the problem that we started to solve. Otherwise, now you're getting that information and keying it back in again in some spreadsheet. That is inefficient. *You mentioned the wire into the mainframe. The wire is already here in the form of Ethernet and a number of competitors, but the vanguard who are trying to access mainframe data now are essentially still getting that printout only as it appears on their screen. They still can't readily search through the data or transfer the data into an applications program on their personal computer and massage it. This is a software problem. How do you see solving that problem?*

Gates: The real problem we have to solve deals with the structure infor-

mation is stored in. You have some data stored in columns and rows and delimited in certain ways. You want to extract data from that and move it down to a spreadsheet, which is also a structure for storing information. Making certain that you can convert from one structure to another is a very difficult problem. It is a problem because there are no standards for data structures down on the micro, nor are there any data structure standards up on the mainframe.

If there were standards on *either* end it would be fine, because everyone would write a converter.

But in each corporation with a mainframe computer there is a different data structure, so each presents a unique problem . . .

Gates: Right. It is quite difficult. If we can come up with a standard database format, we can solve the problem. That is an area in which we can make a contribution with some of our Window-based tools.

How far are we from approaching a solution?

Gates: There isn't going to be one individual event that is going to—boom—solve the problem. The first release of Windows (a forthcoming Microsoft product that will enable multiple windows of data or applications programs to be displayed simultaneously on personal computers from any of a large number of participating manufacturers) will have some structured formats that we would like to see people adopt as standards. We will probably have ways of adding even more structure over time.

Can you go into a little more detail about this?

Gates: Most users who want to access data on mainframe computers don't understand why it's so hard, because they are just thinking of the communications problem: How do I move the bytes from one computer to another? That problem is pretty well solved. As you noted, the wires are available. It's not like there are a lot

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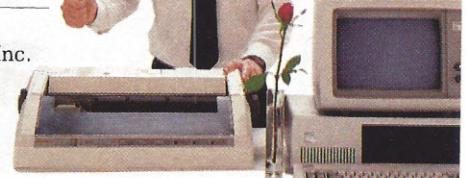
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Let's back up and ask a very basic question: Structure for what?

Gates: OK. Why can't you just take text information from a mainframe and use it? Why can't you pull it into your micro? You want to do something like make a graph. You have data up on the mainframe, and you want to bring it down into your personal computer and make a graph. Well, your computer has to decide what series the data is in; what are the names of the series; are these dates or alphanumeric values, and what sort of number format is being used. There is no well-defined way for how you find those definitions, but that turns out to be fairly simple. We can define where they can be found. But then you say, I want the mainframe to send down a pie chart, or define a color. Well, computers define colors all different ways. Structure is a well-defined set of rules that tells you how to express these high-level things that go beyond a simple character set for a text file.

In Windows you are proposing a structure on the personal computer end?

Gates: Right . . . Once you have a data-interchange-structure standard it could really become universal. It is too bad the mainframe world didn't have a standard. We could use theirs or they could use ours.

When you talk networking or discuss larger computers it is natural to turn to UNIX, the AT&T licensed operating system, in its different versions. Where do you stand in your development of Xenix, the Microsoft variant of UNIX, and its adoption in the microcomputer world?



"If you don't buy a computer system with a specific use in mind, you may be disappointed."

Gates: Xenix is the most popular form of UNIX today. Over two-thirds of all the installations of UNIX in the world are forms of Xenix. That is because a couple of our good customers have done a real good job of getting the software out there, people like Radio Shack and Altos have really gotten behind it.

There is a lot of confusion about UNIX because there are so many incompatible versions out there. You hear terms like V7, System III and System V. No one has any direct association of what user benefits each provides. The world at large is confused, and seems to believe that it will shape up and have meaning over time because everybody keeps talking about it.

Is the personal computer industry doing an effective job of educating the consumer so that he or she can make intelligent choices about using hardware and software?


Gates: We are certainly doing better than we did in the past. There is no question that the technology is under-used in the sense that what the chips can do is not being presented in nearly an easy enough fashion by the software. Even what the software is capable of doing in a reasonable fashion is poorly presented because there is a bottleneck in terms of training.

You can't really say we're doing a bad job because every year we are getting more people to make effective use of personal computers. I don't think we are doing a bad job in the sense that once people buy computers, they are severely disappointed in what they've gotten from the computers. People are cautious enough that they wait until they have a real application in a business setting before they go out and buy a machine.

You don't feel that people are given false expectations or that they don't really understand?

Gates: They are given false expectations. But in most cases, for the amount of money they pay, if they thought about it seriously, and really had a specific use in mind when they bought the system, they won't be disappointed.

But there is still this promise that you can buy a system and in half an hour, use it. That is not legitimate. But most people who buy machines do so after having friends who have really made use of the machine; they see that the one application they understand justifies its purchase, and they're interested in having it do other things.

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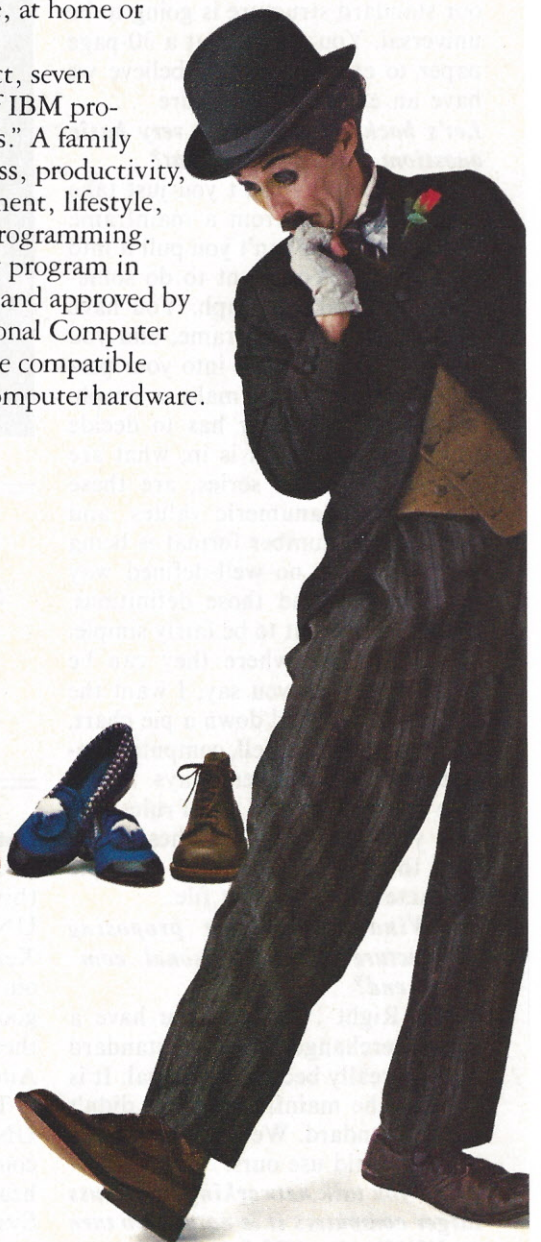
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CIRCLE 53



Stock Market Software For The Serious Investor

Stock analysis packages can give you
the information you need to make better
investment decisions

by Robert Sehr, Associate Editor

Serious stock market investors have, in the past, had to face the choice of gathering, updating, and making decisions about their own stock market data, or trusting their portfolio to a third party. For better or worse, richer or poorer, the investor's success was wedded to the wisdom of his choice. Most serious investors chose a trusted, informed broker who had expensive electronic tools to augment his own intuition about the market. Those wiser still backed up their brokers by doing their own homework on their investments—usually by keeping up with the financial data in the daily newspapers and tracking it with pencil and paper.

Today, however, the electronic tools used by brokers have come within reach of investors; a personal computer, modem, and investment and communications software can be had for less than \$5000.

Obviously, no computerized program will make you an investment wizard overnight. Just as a word processing system will not automatically correct errors of grammar, an investment management system will not correct errors of judgment. "If it were that easy, nobody would bother to get an MBA anymore," says Michael Murphy, editor of *California Technology Stock Letter*. What investment software will do, though, is help you gain intelligence

about the market so you know how to analyze the data you've gathered about your stocks.

There are two types of analysis that are typically performed on stocks: fundamental and technical. Fundamental analysis deals with the underlying strength of a company. It takes into account the company's earnings, sales, profits, earnings per share of stock, dividends paid, etc. Fundamental analysis also tries to determine how the economy, the money supply, and interest rates will affect a company's financial health. Technical analysis, on the other hand, attempts to predict future directions in the movement of the price of a stock, based on the stock's past performance. It takes into account the stock's high, low, close, and volume, which are typically put in graph or chart form. Basically, fundamental analysis helps an investor determine whether he should buy a company's stock, and technical analysis helps him decide when or when not to buy it.

Just how valuable are the software programs that promise fundamental or technical analysis? Norm Nicholson, an economist at DePaul University in Chicago and author of *Computerized Investing*, says the investor who uses a personal computer and software—for either kind of analysis—has a distinct advantage over the investors who don't. "The in-

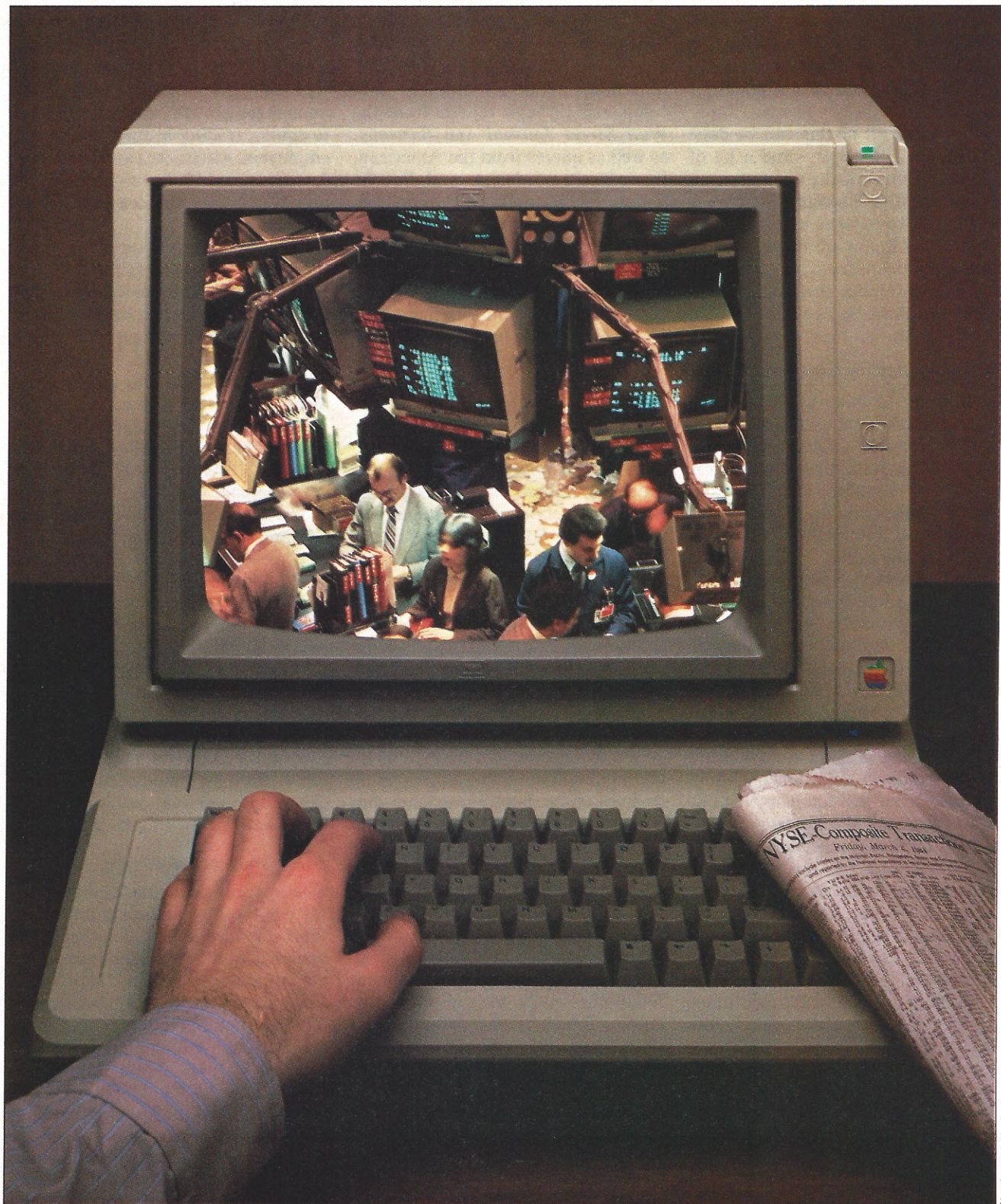
vestor who does not use a computer must be cognizant of the fact that other people are using these powerful tools to process a great deal of data in a short period of time," he says.

But by using a computer and appropriate software, the investor can gain a wealth of knowledge about company performance, which leads to projections and analysis. When a broker is consulted, this knowledge can then be parlayed into a more accurate sell or buy decision using the broker's insights.

In addition to saving time, some stock market software packages offer investors the ability to graphically display certain data they've collected. And graphics is naturally a big selling point for computer-aided investment. To a lot of people, numbers and dates and text are so much jargon unless they can see them depicted graphically.

Ted Costello, vice president of investments in the Palo Alto, Calif., office of Dean Witter & Reynolds, says that using graphics to portray stock trends can make a difference to someone who knows what he's looking for. Costello believes graphics can be especially important to someone looking for technical indicators. With a computer and software, the investor can graphically see changes in the performance of a stock over a period of time, and past performances are often a clue to future projections,

Investment software helps you gain intelligence about the market so you know how to analyze the data you've gathered.



Stock market photograph by Andrew Popper. Computer photograph by Ross Elmi

*With a computer, an investor
has his entire financial data base
only a few keystrokes away.*

Costello notes. For example, "A strong performance of a stock during a general sell-off might be a clue to investor confidence in a company," he says.

Of course, all of this can be done with pencil and paper—and a lot of patience. But with the computer, an investor's entire financial data base is only a few keystrokes away. He can tell how his stocks are doing, how he can expect them to do, and what factors may influence their future performance. And he can see it all in graphic form.

The information time factor

In addition to having his financial data base available on his computer, the investor has another important service at his fingertips: communications. With a modem and communications software, he can get important stock information before the general public does.

Once information is widely distributed, it loses its advantage to the investor. If you own a hundred shares of XYZ Gas & Electric, for example, and you read in the evening paper that the company decided to permanently shut down a nuclear power plant, it would probably be too late to make a timely decision on the status of your holdings. But knowing about it shortly after the company's public affairs department released the information to the general media could save you money. For this reason, on-line services providing up-to-the-minute corporate and historical information on public companies listed in the nation's various exchanges can be valuable.

There is one caveat, though: In order to receive the information before the general public does via radio or newspaper, you'll have to discipline yourself to access an on-line service at regular intervals—for instance, every hour. That way you'll be sure you're getting the information only an hour after it was released.

The best known of these informa-

tion services is the Dow Jones News/Retrieval service in Princeton, New Jersey. Its service provides current news about all publicly held companies through reports from the *Wall Street Journal* and *Barron's*, as well as quotes from the American, New York, Midwest, and Pacific Stock Exchanges and over-the-counter markets. Dow Jones also maintains a historical data base where users can search for information through the use of a key word. Other investment information available on-line includes 10-K, 10-Q, and 8-K reports which public companies must file with the Securities Exchange Commission.

Other on-line data bases, like the Source and CompuServe, provide current stock information as part of a general data base that covers a large variety of services. Still other services, such as Data Resources, Chase Econometrics/Interactive Data, and I.P. Sharp, do not have the range of current financial news that Dow Jones has, but offer instead financial and economic data and programs for analysis of data. These services are, however, fairly expensive.

What's available

If you're warming to the idea of investment software and access to an on-line service, but want to keep your costs to a minimum, there are plenty of packages on the market to choose from.

The Dow Jones Investment Evaluator (\$149), for example, from Dow Jones News/Retrieval, tracks stocks or warrants, bonds, mutual funds, options, or treasury issues. Investment Evaluator—available for the IBM, Apple, Texas Instruments Professional Computer, Commodore 64, and Atari 800/1200XL—does not allow you to do what-if calculations, nor will it produce graphs on stock value over time. What it does provide is access to the Dow Jones on-line service, without the need for additional communications software.

From the on-line service, you can obtain stock performance for the past six months; 10-K statements; general financial information like a company's annualized growth rate, ratio of debt to equity, trading history, number of employees, assets, etc.; and consensus forecasts from 1000 analysts on earnings per share projected for each of 2400 companies.

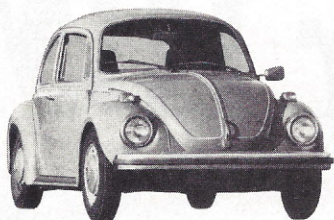
Another package from Dow Jones, the Market Analyzer (\$299), also interfaces with the News/Retrieval Service. One feature it has that is not offered by the Investment Evaluator is the ability to produce charts and graphs based on various technical indicators from the information on the News Service. The program is available for the Apple II Plus, Apple III, and the IBM Personal Computer with graphics card.

The Dow Jones Market Analyzer also provides access to the on-line service, although its \$699 price tag may be prohibitive for some investors.

There are other analysis programs that work with the Dow Jones service, although they're not provided by Dow Jones. Examples are the Unfair Advantage from SSB Programming in Indianapolis, Ind., for the Apple II or Apple IIe, and the Strohl Stock System for the IBM Personal Computer. Both systems analyze market trends and point out buy/sell signals based on their own formulas.

More software needed

The analysis packages mentioned so far come complete with communications software. There are other packages available which require separate communications software in order for you to go on-line with a news service. The Market Maverick from Financial Software Inc. in Chardon, Ohio, is one such package. It computes a target value for 920 stocks in a data base supplied with the program, and pays attention to the effect of inflation on the price/earnings ratio. The software, for the Apple II and IBM Personal Computer, ranks



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With a modem and communications software, you can get important stock information before the general public does.

stocks in terms of appreciation potential.

Another example is Stock Price Forecast from J.R. Software in Florissant, Missouri. This menu-driven program for the Apple II provides target prices based on information you enter on particular companies. The program develops a model of the stock's yearly high and low prices based on history and economic indexes. Graphs can also be generated.

Some software packages, such as Blu Chip from XOR Corp. in Minnetonka, Minn. (\$79.95), come with hypothetical portfolios. This means you can experiment with the programs without risking your own stocks. With Blu Chip, you enter the name of the stock and its ticker symbol, the date you purchased it, the brokerage firm, broker, his commission, and miscellaneous charges. The program automatically figures the estimated worth of the stock, and what you would make if you sold it at the price you entered. The program also highlights your net gain in red if you take a loss.

Blu Chip also allows you to do what-if calculations. For example, you can determine what a stock's selling price would have to be to make a profit if you sold. You fill in the estimates, and the program calculates the net gain.

Many of the same tools that brokers pay thousands of dollars for—such as Compustat from Standard & Poor's, which holds a data base of several thousand names—are now also available for personal computers, and at a fraction of the cost. For instance, Standard & Poor's makes a data base called Stockpac, which is available for TRS-80 computers. With Stockpac you can keep up with up to 100 securities on a disk, create custom reports, and compare them to Standard & Poor's 900-stock data base. Value Line Inc. has a similar package for the Apple II and IBM Personal Computer called Value/Screen, which covers up to 1650

stocks through 32 parameters. Monthly updates keep investors in touch with the latest Value Line and Stockpac statistics to help identify key stocks and buy/sell signals. Both programs are priced under \$500, which is a far cry from the tens of thousands of dollars brokerage houses pay for mainframe services providing some of the same information.

As the processing power of small computers increases, statistical software will become available that is comparable to mainframe programs now used by brokerage houses. Norm Nicholson at DePaul University says statistical packages now being developed for personal computers provide some of the most sophisticated forecasting techniques in current use. Nicholson compares them to the time-series analysis used by institutional researchers. In this analytical program, Nicholson says, esoteric statistical routines, such as autoregression integrated moving average models (ARIMA), are used to make forecasts of interest rates, market indices, and other economic variables. Other statistical routines, such as regression analysis, are used as the basis for stock valuation models.

Having any or all of these tools available—now or in the future—naturally does not guarantee success in the market, any more than having a computer in college will guarantee that your children will finish at the top of their class. You still need a lot of personal initiative and drive.

One investor who has demonstrated such initiative and drive with computer-aided investment is Marvin Vander Kooi of Cupertino, California. Vander Kooi is an electrical engineer by trade and a stock market player in his free time. He's also president of the Santa Clara County Commodore PET user's group. As a result of his investment success, Vander Kooi is about to become a full-time investor. "I've made enough to try it (investment in the stock mar-


ket) full-time for a couple of years."

Vander Kooi picks up stock information through his modem off the Dow Jones News/Retrieval Service, using a Commodore 64. He then transfers this information to his PET. He uses his own program to make models of highs and lows from a number of industry groups, and determines from these models the performance of different companies and industry groups over a period of time. From this data, he makes projections as to the fair price of stock, likelihood of dividends, and the future trends in the group.

Vander Kooi began keeping his portfolio on his computer in 1978—only a year after acquiring his PET—and has managed quite well since then. He says he has become wealthier as a result, wealthier than he would have been if he had to perform his calculations with pencil and paper. "I still spend entire evenings making determinations," he says, "but I do so with greater accuracy and efficiency."

Using a spreadsheet

But what if you're not a programmer, or you have a computer and a spreadsheet package and don't want to invest in other software right now? Using a basic electronic spreadsheet program like VisiCalc, SuperCalc, or Multiplan, you can begin doing some what-if manipulations on your stocks. Spreadsheets offer many investors a step-by-step, hand-held guide through the art of what-if calculating. Many percentages that would take hours of calculation on paper can be done for a whole group of companies in seconds with a spreadsheet. With newer spreadsheets, graphic portrayal of data and complicated calculations involving a large data base are also possible.

So with the diversity of products available right now, and more promised for the future, it may be time to plan a different investment strategy—and include your computer. 

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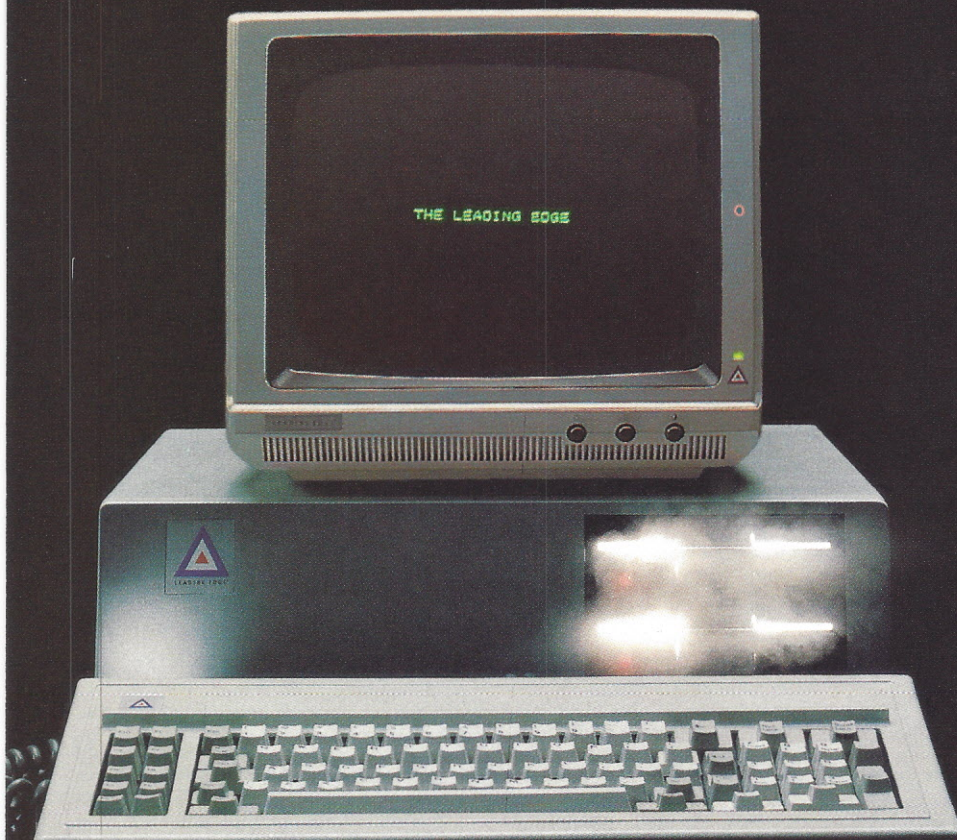
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